UNDERSTANDING VALUES AND ATTITUDES TOWARD RECYCLING: PREDICTIONS AND IMPLICATIONS FOR COMMUNICATION CAMPAIGNS

By

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This dissertation is dedicated to my mentor, Dr. Kim B. Rotzoll, who predicted the route I was taking years before I entered it. May I strive to justify the faith and intuition.

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Since the 1980s, waste management issues have emerged as a key concern for Florida, a state with rapid population growth. Because the influence of the legislature is limited to supporting the counties in their recycling efforts, a vast discrepancy exists among Florida's 67 counties.

While recycling figures and participation percentages might be difficult to comprehend, their role as an environmental problem is not. Because research into intrinsic motivation considers fundamental factors in actual decision making, an important concern of public entities in charge of community recycling has always been to determine why people do or do not participate in these programs.

Environmental values have been found to be a key determinant for pro-environmental behavior and, therefore, regulate the manner in which behavior occurs. Social marketing efforts often compromise a person's values, in order to promote values deemed socially more compelling by the sponsoring organization. Since individuals hold-

ing opposing values may be reluctant to comply with the marketing goals, it seems critical to incorporate personal values into a public campaign.

The purpose of the present study is first to test the Theory of Planned Behavior as an explanation of recycling intentions. The theory maintains that attitudes, norms, and perceived control elements determine behavioral intentions. Second, the study will explore more fully what role values play in explaining recycling intentions.

A telephone survey was conducted during the last two weeks of May 2002 in Gainesville, Florida. It was hypothesized that residents' attitudes, subjective norms, and perceived behavioral control would equally predict recycling intentions. It was further hypothesized that the inclusion of values would increase the likelihood to explain recycling intentions better.

The findings suggest that attitudes toward recycling are the most significant predictor of intentions. While certain values correlated well with the TPB model variables, values did not significantly improve the parameters' predictability over intentions. However, the close correlations values have with beliefs and evaluations of recycling imply that values can expand the applicability of behavioral models for recycling. On a practical level, the study suggests that an understanding of values can improve communication campaigns that aim to change or reinforce habits.

CHAPTER 1
INTRODUCTION

Since the 1980s, waste management issues have emerged as a key concern for state and local governments in the United States, particularly in states with rapid population growth. In Florida over 24.8 million tons of solid waste were collected in 1998 (Department of Environmental Protection 2001), an increase of over 500,000 tons from 1995 (Department of Environmental Protection 1996). This translates into 9.1 pounds per person per day. While this figure is slightly lower than the estimated Florida average of 10.2 pounds/person/day (DEP 2001), the corresponding recycling estimate is dramatically below reality. Florida's prediction report for 1998 estimated that 10.1 million tons of waste (about 36% of the total) would be recycled. The actual recycling rate for 1998 was 6.9 million tons, or 28% (DEP 2001). This means that 270 pounds per Floridian per year will actually end up on landfills instead of being recycled.

Although Florida's average recycling rate of 38 to 40% ranked highest in the nation (Environmental Protection Agency 1999), the state placed 56% of its total waste in landfills and 16% in combustion. In other words, the recycling quota is in a negative trend (-12% from 1995). With a population growth projection between 17.5 and 23 million people by 2020 (DEP 2001, Roe Littlejohn 1997), there is ample concern about Florida's waste management.

Florida's Department of Environmental Protection and individual counties administer the funds for education and information (media). As a result, the incorporated municipalities have a great deal of discretion in structuring the actual recycling programs

within their boundaries (Martinez & Scicchitano 1998). The influence of the legislature is limited to mandating certain waste reduction figures (currently 30% should be recycled for counties with populations over 50,000) and introducing recycling goals for individual counties. A vast discrepancy in recycling rates exists among Florida's 67 counties, ranging from a recycling rate of 38% in Lee County to 5% in Hendry County (DEP 2001). Recycling success or failure cannot simply be explained by factors such as urbanization, population size or citizens' educational and income levels.

Alachua County, the home of Florida's largest public university, is a rather rural county in the northeast part of the state. With a population of about 212,000 it ranks only nineteenth in population size among all counties. However, it shares the fourth rank with Palm Beach County in recycling rates (DEP 2001). It not only surpassed counties with metropolitan areas, such as Orlando, Miami, and Tampa, but also counties with educational centers, such as Leon County, where Florida's second largest university is located. If not demographics, what explains Alachua's success? The county and its largest community, Gainesville, have managed to establish curbside recycling pick-up service to 96% of single-family dwellings and 5% of multi-family dwellings (apartment complexes). Among those with service, 80% of single-family homes and 4% of multi-family homes participated, for a total participation rate in the county of 58% (DEP 2001). Although a rate of 58% is compared to other counties an adequate level, it also means that 42% of the population are not recycling. Simply judging from the service-to-participation relationship, one notices that 17% of homes that could recycle are not currently recycling. It seems that creation of service is not enough to overcome reluctance to recycle in certain individuals.

While the amount of waste and participation percentages may be difficult to comprehend, their roles in environmental problems are not (Bagozzi & Dabholkar 1994). Given that environmental problems and social ills are interconnected, waste management is a social problem with far reaching consequences in the areas of human health, ecological balance, and the local economies (Starke 1991). Consequently, determining consumers' reluctance to recycle created considerable research interest in disciplines such as psychology and environmental policy (Arbuthnot 1977; Hines, Hungerford & Tomera 1987).

Thogersen (1996) describes recycling research as falling into two main theoretical approaches. The first, applied behavioral analysis (Stern & Oskamp 1987) provides information about reactions to extrinsic stimuli. The second, attitude research (Hopper & Nielsen, 1991; Kok & Siero 1985) analyzes the cognitive (attitudinal) antecedents believed to guide the behavior. Because research into intrinsic motivation considers fundamental factors in actual decision making, it bodes well for future effort of determining motivating factors of recycling (Bagozzi & Dabholkar 1994).

Purpose of the Study

The purpose of the present study is twofold. First the Theory of Planned Behavior (Ajzen 1985) was tested as an explanation of recycling intention. This provided an effective framework for studying the determinants of recycling behavior. The Theory of Planned Behavior hypothesizes that intentions directly determine behavior and are themselves influenced by attitudes toward the consequences, projected subjective norms about others' opinions, and feelings about personal control over one's behavior and its outcomes. Despite its successful application to recycling behavior (Oskamp et al. 1991;

Vining & Ebreo 1990), most studies have not operationalized the variables specifically, but have deviated from the recommended practice of applying all determinants as specified by the theory. Thus findings have been mixed. By applying the Theory of Planned Behavior in the current study, the full model was tested. The findings were then compared to an augmented model in which recycling-related personal values were introduced as a predictor of recycling intentions (Schwartz 1992; Stern & Dietz 1994).

The second purpose of this study is to more fully examine the determinants of attitudes, subjective norms and perceived behavioral control as they relate to recycling. The study models and builds upon the research of Bagozzi and Dabholkar (1994), who stated their purpose as follows:

> "Previous research using attitude theory has investigated antecedents based upon beliefs and evaluations and organized these into the summation of the products of beliefs and evaluations. This approach works best for physical products or when the consequences of acting are concrete and tangible. But because recycling involves abstract goals and values and is highly subjective, the traditional approach is less useful. Recycling-related beliefs are *concrete judgments* about the consequences (positive or negative) of recycling and tend to focus more on *means or outcomes* (e.g., inconvenience, saving money). Recycling goals, in contrast, are *abstract motives* for recycling (by definition positive) and refer to *ends* (e.g., provide for future generations). Recycling beliefs enter decision making as reasons for or against acting; recycling goals are more conative and may even be deontological moral values that motivate or compel one to act. Many recycling goals, particularly higher-order ones, do not arise from decision making but are a priori virtues. Another problem with the traditional approach is that it does not address the hierarchical organization of the antecedents to attitudes, subjective norms, and past behavior. Our second objective is thus to discover (a) the key antecedents, (b) how they are structured, and (c) how they influence the proximal causes (i.e., attitudes and subjective norms) of decisions to recycle" (p. 318-19).

In other words, it is important to separate between beliefs and goals, or values that lie beneath beliefs and are unencumbered by cognitive decision making processes.

Assuming the role of a priori virtues, values are more difficult to influence by everyday stimuli while at the same time determining to a large extent the motivation to act.

Theoretical Rationale

Most marketing and mass communication research has focused on studying demographic variables, knowledge, or environmental concerns (Vining & Ebreo 1990; Van Liere & Dunlap 1980). Previous researchers (Oskamp et al. 1991) sought to identify demographic and psychographic profiles of environmentally concerned people in order to use this information for product development or target segmentation. Environmentally conscious or "green" consumer segments have become increasingly important for the proliferation of products and services as well as corporate images (Elkington 1994; Kassarijan 1973).

This mode of thinking seems to reflect the prevalence of the established 'consumption constellation construct,' (Lowrey et al. 2001), defined as "a cluster of products and consumption activities associated with a social role" (Kamins & Assael 1987). It suggests that attitudes toward products symbolize information about the consumer's self-identity. In the realm of social and environmental issues, this correlates to a scenario in which a positive attitude toward a cause leads to a positive behavior with respect to that cause.

A shortcoming of most research of environmental concerns is that the conceptualization and measurement are too broad. Many previous studies cover both a wide range of psychological reactions and a wide range of behaviors within the same construct (Bagozzi & Dabholkar 1994). By mixing the many psychological reactions with the many behaviors, the construct makes it difficult to predict specific behaviors beyond

tautological interpretations (Van Liere & Dunlap 1981). Ajzen and Fishbein (1980) suggested that there is reason to expect that "attitudes toward a target may be unrelated to a person's beliefs about the consequences of performing a specific action toward that target" (p. 88). For example, a person may hold pro-environmental opinions, but in no way be inclined to participate in household recycling activities. The particular individual may not perceive his or her behavior as negatively impacting the environment.

A promising line of inquiry examines the behavioral and attitudinal causes of recycling. Those using expectancy-value models (such as the Theory of Reasoned Action or Theory of Planned Behavior) largely subscribe to a rational actor idea. In these models, the individual weighs the costs and benefits of the outcomes of his or her behavior and acts accordingly. Although it was found that economic sensibility is one of two basic attitudes leading to sorting of recyclables (Israel 1991), it was not so much the economic motives but the idealistic motives (protecting the environment) that stimulated people to participate. De Young (1986) reported a close association between derived satisfaction and intrinsic motivation. These motives allow for the inclusion of ethical and altruistic positions, in which the individual might not be the beneficiary of the action. Ultimately, both positions are results of the abstract goals and values origins of the behavior.

While personal values define individual goals, goal-directed behavior is considered the substance for both rationality and altruism (Pierce 1979). Essentially both the economic and the socio-psychological models of man emphasize two basic cognitive components: values and beliefs (Shapiro 1969). Values are responsible for the selection and maintenance of the ends or goals toward which human beings strive. Beliefs are

proscriptive convictions upon which humans act by preference (Allport 1961) creating an intervening variable for behavior. Values in turn regulate the methods and manner in which this striving takes place (Vinson et al. 1977).

There is debate about the degree to which value systems at the societal level directly drive society-environment interactions. A growing body of literature on the distribution of risk within and between nations treats decisions about technological risk as revealing societal value preferences (Beck 1992; Salmon 1989). Some nations (Germany, Great Britain, and the U.S.) are willing to accept the risk connected to advancing technology, such as nuclear energy generation, while others (Denmark, Sweden) are more concerned about the risk element and approach progress more carefully.

Public information campaigns take the form of social interventions that have been prompted by the determination that some situation represents a social problem meriting social action. These campaigns are logically seen as a value-laden activity, where people bring their own moral judgments to an activity (e.g., anti-yard burning campaigns). Not all persons will agree upon the ends pursued (stop yardburning) and the means used to achieve these ends. At the center of this conflict is the fundamental tension between social control and individual freedom (Salmon 1989). As such, social marketing or communications efforts necessarily compromise certain values and interests, in order to promote values and interests deemed more socially, economically or morally compelling by the sponsoring organization of the change effort. As a result, individuals holding opposing values will be reluctant to comply with the message content.

Previous research on the values origins of general environmental concerns and specific environmental behavior, such as recycling, identified three "ethics"

corresponding to three classes of valued objects. These are: the homocentric (or socio-altruistic) which focuses on other people; the ecocentric (or biospheric) which focuses on nonhuman objects; and the egocentric (or egoistic) which focuses on the self (Stern et al. 1993; Merchant 1992). The first two have often been combined in subsequent research (Stern & Dietz 1994) to form a general altruistic ethic toward human and nonhuman entities. Schwartz (1992) eventually added a traditional orientation as a fourth "ethic," implying a behavior using internalized societal norms (such as local customs).

A communication study that examines the origins of recycling beliefs and intentions will provide implications for public policy, marketing communications, and future public service or advocacy campaigns that aim to affect behavioral change. By providing additional information through extensions of the studies of Ajzen and Fishbein (1980) and Bagozzi and Dabholkar (1994), we hope to further clarify the role of values in citizens' attitudes and behaviors toward recycling. Values, as enduring beliefs in the preference of a specific mode of conduct (Rokeach 1973), form the foundation for human attitudes and perceptions of the world. Communicators need to understand the nature and range of values (and how different value orientations affect both attitudes and consequent behaviors), if they want to predict outcomes of policy decisions. Social marketers and advocacy communicators must learn how to craft more successful advertising messages for issues and causes of local, national and global concerns.

Scope and Limitations

Any sampling choice has the potential not to be representative of an entire area population, let alone the population of the entire country. The current study should be seen as offering a theoretical relationship between values differences and their potential

impact on behavior in a narrow geographic area. Although any limited survey will never elucidate the tendencies of an entire population, it can point to other relevant avenues for future research.

While the current study postulates an extension to an existing model of human behavior regarding recycling, it also naturally excludes additional variables that may moderate or explain recycling behavior, such as personal effort or the influence of persuasive cues. While researchers do not always agree on the exact impact of a given variable on recycling behavior, values do indeed have an effect, either by reinforcing existing beliefs and attitudes or by obstructing or counteracting situational attitudes and norms.

Finally, issues of measurement reliabilities in the model construction need to be addressed. While it is hoped that proper pre-testing and variable definition will largely eliminate confusion and misunderstanding, the potential of misunderstanding in defining and measuring a rather amorphous and seemingly intuitive construct such as a value does exist. Since people might not apply much cognitive effort to summon a personal value (unlike the attitude toward an object or behavior), it is the researcher's responsibility to minimize confounding influences.

CHAPTER 2
REVIEW OF THE LITERATURE

This review consists of four main sections:

- A brief overview of social issues and environmental issues communication theory with an emphasis of waste recycling literature.
- A discussion of the Theory of Reasoned Action and review of selected empirical studies in which this theory was used as a framework for recycling.
- A discussion of the Theory of Planned Behavior and review of selected empirical studies in which this theory was used as a framework for recycling.
- A review of values research, its use as a framework in recycling studies, and the development of the final model to be used in the current study.

Social Marketing

Social issues are ideas that are of interest to many individuals within a society (Fine 1981). They differ from commercial ideas (for tangibles or services) as they are not only motivated by self-serving goals, but by a desire to help others. Most social issues benefit other people more than the individual acting on a social message, while he or she carries most of the burden or cost. For instance, avoiding littering to preserve nature's pristine beauty when one has to carry the wrapping paper of a hamburger for hours because there are no receptacles around is generally considered a huge cost by most people, while the benefit to the self does not seem evident.

The adoption of new social ideas is closely related to the formation of values, attitudes, beliefs, interests, and opinions about issues. A belief (as well as the related concepts) can be regarded as a mental acceptance of the validity of an idea. The totality of all

beliefs – the belief system – determines the position one takes on an issue, which often prompts participation in social action (Fine 1981).

At first glance the adoption process for social ideas does not seem to be too different from that for commercial goods. At the heart of all marketing lies a philosophy of consumer orientation. Goods and services are described as the solution to a problem. The aim of marketing efforts is to position this idea in a way that potential consumers of the good accept this description and act accordingly. Social marketing, or the marketing and promotion of social issues, distinguishes itself from commercial marketing by two key components. First, the "product" of social marketing is often amorphous, a mere idea of what ought to be, such as physical health, pollution control, social justice, gender and race equality. This makes it fairly difficult to attach a price to the "product," not only for the change agent, but also the consumer. This, in turn, has effects on promotion, which is often in an interactive relationship with price. It also affects measurement of the social price of an idea for cost/benefit purposes. Ideas of "breaking even" and "getting what you paid for" do not seem to apply well.

Second, related to this is the idea of consumer response within the larger field of consumer research. One difference lies in the nature of the forces motivating purchase (or adoption) behavior. The perceived (and actual) consequences could be more far reaching, more involving, than the effects of an ordinary purchase. Being a Ford Truck owner is a less profound statement than being a Greenpeace activist. It would seem that adoption behavior is based on more subtle and indirect motivation than acquisition behavior. In committing oneself to follow a particular movement, one probably undergoes a good deal of forethought. Impulse buying is not very prevalent (Fine 1981). In adopting an idea,

reinforcement through gratification either occurs as a delayed reward (weight reduction, quitting smoking) or it accrues not to the individual, but to society as a whole (pollution, equal employment).

It makes sense that social consumer behavior is well suited to be studied within the broader discipline of consumer psychology. The argument is that conceptual frameworks (such as perception, cultural values, attitudes, group influences, personality, learning, and information processing) form an important role in understanding a consumer's opinion and reaction toward a social issue. Wasik (1996) argued that "the ultimate extension of marketing is the selling of values" (p. 59).

One area that fits squarely under the above-mentioned agenda is the relationship of people toward their natural environment. A heightened research interest in this relationship is documented by a subfield of social issues communication (the area of environmental, green, or eco-communication). The next segment introduces this discipline and discusses the particular circumstances that surround environmental issues.

Environmental Research in the Social Sciences

Environment as a Social Construct

Social theorists, studying environmental risk perception, concentrate almost exclusively on the social and economic spheres and have tended to neglect the cultural arena (Beck 1995). The environment is more often associated with the natural than the social sciences, explaining in part the silence of sociology on this issue. When it was examined, the relationships between society and nature were seen as distinct spheres governed by different temporal mechanisms.

Throughout the history of Western thought there have been competing models of the relationship between humans and nature. Some have depicted nature as a state of chaos. Thomas Hobbes (1651/1958) viewed the natural human condition before the emergence of civilized society as brutish and short. By contrast, his contemporary John Locke (1690/1960) thought that nature was a state of humanitarian bliss; "natural laws" must form the basis of a just society. "Nature," or our relationship with the physical environment, is socially constructed. "Nature" is culturally and historically constructed since our perceptions are inextricably bound up with particular models of society that are dominant at any one period in time.

Recently anthropological studies have concentrated on how certain social problems come to be defined as risks. A study by Douglas & Wildavsky (1982) suggested that our selection of risks is influenced by social values and the way in which different cultures operate. Competing public perceptions of risk are equally biased because they reflect different cultural meaning systems. Alex Wilson (1992) in his seminal book entitled '*The Culture of Nature*' explored some of the ways in which "nature" is culturally constructed in modern society. He argued that nature cannot be separated from culture since it is mediated through major social institutions and the culture industry.

For the German social theorist Ulrich Beck (1992), risk, appearing in the natural environment (e.g., nuclear reactor explosions, greenhouse effect, groundwater contamination by leaching landfills) has become a central anchor for conflict in modern industrialized society. He argued that riches are tangible goods that are understandable. Production is the result of methodological thinking and execution. In contrast, the perception of ecological devastation and the consequences of industrial growth are difficult to grasp. This

perception can depend to a much lesser extent on methodological knowledge, measurement procedures, rules of accountability and acknowledgement in science and law, and on information policies of suspect operations and cooperating authorities.

Perception of devastation must break through the wall of denial that stems from the fact that most ecological disasters elude pinpointed scientific measure, making it hard for scientists to generate laws. There is no trend in sight that experts are getting organized. Neither can those who report isolated cases escape playing the role of a "deviant expert." In the ecological conflict, individuals or small groups can act with considerable effect. The politics of the ecological question involve universal themes. The conflict even passes through people. While one's heart may beat "Green," one's mind and routine continue in old habits.

Unlike social issues, ecological ones often face human inactivity. While our own experience supports action on the social question, the ecological issue is not merely abstract. It virtually requires that we ignore our own senses. Although poverty can be made to disappear statistically, it remains painfully present for those who endure it. On the other hand, air pollution from cars or land pollution from littering resembles examples of 'prisoner's dilemma' theories (Van Vugt et al. 1995). Often the menace can only be perceived in defiance of the semblance of normality (Beck 1995).

Only by using complicated measuring instruments can the nature and degree of the threat be determined. Thus, threats replace individual organs of perception with governmental, bureaucratic, and scientific "organs." The blindness of everyday life with respect to the omnipresent, abstract, scientific threats is a relative and revisable process. It depends on the socially available knowledge and how much society considers it worth-

while to pay attention to these events that "at first glance" appear to be nonexistent. Ways of acting need to be rewarded that simply raise into view what was previously invisible. Democracy can be protected from perishing in the thicket of risk expertocracy. Those who would open people's eyes to the ecological issue and keep them open must redirect and inspire society's knowledge and perception through education and training. Beck (1995) argued:

> "Only if nature is brought into people's everyday images, into the stories they tell, can its beauty and its suffering be seen and focused on. Seeing is cultural seeing, attention is narrated attention. Our culture, and therefore, we ourselves, see and hear in symbols, in which what is invisible or forgotten stands out and lives figuratively. This does not just happen; rather it is done, often against resistance. Knowledge of cultural sensitivities is just as significant for this work as are courage or objective knowledge" (p. 56).

The social and economic importance of knowledge grows similarly, and with it the power over the media to structure knowledge (science and research) and disseminate it (mass media).

Environment in the Media

Many risk communication studies are based on the underlying assumption that it is possible to judge the quality of reporting through the use of objective measures. Although we cannot totally dispense with the objective ideal, objectivity is not necessarily the same thing as accuracy. For instance, with culture variously being defined as incorporating values and norms, ideology, subjective states, rituals and discourse, events discussed by the mass media often tune into deeply held cultural beliefs. Particular issues that attract attention tend to be mediagenic and often possess a powerful symbolic resonance.

The importance of culture in the local context drives the framing of public understanding of environmental issues. Lay audiences often draw on local knowledge in making sense of those issues. Though the news media play a significant role in shaping attitudes, audience research suggests that we may take on different subjectivities in interpreting media texts. In other words, our reading of media texts is framed by our pre-existing attitudes and social and cultural backgrounds (Allan et al. 2000).

Media reporting on environmental issues is often risk-led. Coverage is often based on anxieties, concerning threats to health posed by major incidents, accidents, or disasters. People's attitudes about risk are largely focused on specific risks rather than an outlook on environmental issues in general. Where some risks are concerned, there are important divergences of perception between policy-makers, scientists and the public. The environment, like other substantive areas of media reporting, is largely mediated through the "expert" as the voice of authority, using quantitative measures as a basis for risk perception. They often marginalize lay views (Bell 1994), which are more likely to be influenced by qualitative assessments. Risk "experts" are often critical of the mass media, arguing that risks tend to be distorted and the media are too reliant on pseudo-experts. Media practitioners tend to treat issues in a rather emotive way, exploiting the human interest factor.

Stories lacking emotive quality (such as household waste recycling) are usually not communicated, or communicated in a way that would shape attitudes in favor of the subject. With lack of interest from the editorial side, it seems to be the commercial communication field that aims to reach and form ecological awareness.

Environment and the Consumer

Although concerns about environmental issues have objective roots, they are shaped by the promotional activities of issue sponsors and culture representation (including advertising, photography and art). A change in the perception of nature has led to a growing recognition of the need to "manage" public opinion concerning the environment. Since the mid 1980s significant energies have been channeled into the substantial risk-management industry and corporate green advertising (Anderson 1997).

The reason for this activity was that many businesspeople believed that the 1990s started an "environmental decade" (Fisher 1990). In fact, consumer interest in environmentalism, a phenomenon labeled "green consumerism" by Ottman (1992), grew in the marketplace, primarily fueled by an increasing awareness of issues due to increased media coverage of disasters, such as the Exxon Valdez spill and the Bhopal killings. A generation who grew up with environmental education had meanwhile reached working and voting age. It seems that the public had begun to realize that their consumption activities contributed to environmental problems. "As a consequence there appears to be a growing desire to protect the environment as evidenced by a seeming willingness of consumers to avoid products that they believe contribute to environmental degradation" (Carlson et al. 1995).

The end result of "green advertising" can be understood as an attempt to engineer change in society. A media or information campaign takes the form of social intervention prompted by the determination that some situation represents a social problem meriting social action. This campaigning effort is logically seen as a value-laden activity, as not all persons will agree on the ends pursued and the means used to achieve these ends. At the

center of this conflict is the fundamental tension between social control and individual freedom (Salmon 1989). As such, social marketing or communications efforts necessarily compromise certain values and interests, in order to promote values and interests deemed more socially, economically or morally compelling by the organization sponsoring the change effort.

Depending on the context, this social situation can take the form of some individual or group, a change agent or agency, making such determinations. As a case in point, some individuals might engage in behaviors which bring them pleasure or facilitate their lives, but which also have a level of risk associated with them that a change agent considers too high. In general, any phenomenon that happens in and to the environment has usually major consequences for humans (greenhouse effect, ozone layer, erosions, groundwater contamination, and air pollution to name a few).

Both J. Walter Thompson (1990) and The Roper Organization (1990) have conducted large-scale surveys in the United States. The findings empirically supported the success of campaigns in identifying relatively large and emerging consumer segments with a definite lifestyle and propensity to "buy green" (Fuller and Allen 1995). The reason for why "green consumerism" became one of the most accepted areas among all environmental issues seems to be found in the fact that it resembles most the marketing scenarios of commercial marketing. It is important to point out, though, that the bulk of environmental marketing – and social marketing in general – has to deal with challenges that are qualitatively different and unique to its field. Those comprise characteristics, such as lacking demand (enticing positive behavior toward a service for which the target audience sees no need), obscure benefits (encouragement of a behavior that leads to the

absence of a negative outcome), or third party benefits (payoff of a behavior goes to a third party or society in general) (Andresen 1995; Kotler and Andresen 1991).

A case in point is the effort of local communities to deal with the reduction of household trash, officially called municipal solid waste (MSW). As more landfills are filled to their capacity, various municipalities in the U.S. have engaged in serious efforts to promote waste avoidance in the form of reducing, reusing, or recycling waste. The acceptance rate to cooperate is different for cities and states. Household waste recycling constitutes an example of the third-party benefit characteristic.

Environmental Research

As early as the 1970s, marketing efforts have attempted to identify the ecological oriented consumer. A flurry of research was conducted to profile population segments that showed environmental concern (Anderson and Cunningham 1972; Balderjahn 1988; Kassarjian 1971). Throughout the 1980s other academic areas began concentrating on the ecologically-conscious public as well, such as sociology (Van Liere and Dunlap 1981), education (Hines, Hungerford and Tomera 1987), and psychology (Arbuthnot 1977). Similar to marketing studies, these research projects concentrated for the most part on descriptive information, such as demographics, with some focusing on personality and psychological factors, such as alienation, attitude toward pollution and knowledge of environmental issues (Polonsky et al. 1995).

Overall, the relationships of demographic and socioeconomic variables with ecological concern did sometimes result in inconsistent or contradictory findings with respect to the direction of the assumed relationship. On the other hand, constructs such as personality measures, dogmatism, and attitude studies showed some promise (Kinnear,

Taylor and Ahmed 1974). The idea behind these constructs was that each citizen has a duty to the community and future generations in an environmentally responsible manner. Schudson (1991) in his framework analyzed the consumption culture. His findings not only echoed the psycho/social indicators, but also added the construct of social norms or pressures as a guide for environmental behavior.

Unfortunately, much of the past behavioral science research has studied general environmental concern rather than more restricted topics (Oskamp et al. 1991). After reviewing 23 articles that investigated factors relating to environmental concern, Van Liere and Dunlap (1980) recommended that environmental concern should be studied in terms of more specific environmental issues. Research should investigate people's beliefs and attitudes of those issues concerning trade-offs to other valued goals. Dunlap and Van Liere (1984) found, for instance, that traditional American values (e.g., support for economic growth) were detrimental to maintaining a strong proenvironmental stance.

Recycling is used in this project as it is a good example for an action that typically offers little direct benefit to the individual, but that often involves substantial personal cost with respect to time and effort (Smith et al. 1994). Next, the attention is turned to the specific environmental issue of recycling.

Definition of the Recycling Term and Current Situation

Municipal waste recycling, or post-consumer recycling, is a term applying to the recycling of waste materials generated by personal consumption activity as opposed to those generated directly by industrial processes (Fuller and Allen 1995). Recycling is defined as "the extraction and reuse of useful substances found in waste" (American Heritage Dictionary 1985). This definition implies a circular flow of product disposition, as

opposed to the traditional linear one, to reintegrate materials in the market (Fuller and Allen 1995).

Of the twenty most industrially advanced democracies in the world, the U.S. ranks fifteenth in paper recycling and nineteenth in glass recycling. According to the Congressional Research Service, "Other countries use less packaging than the U.S., recycle more of it, and are considering recycling policy measure stronger than measures generally being considered in America." Despite the fact that on a per capita basis, as well as in absolute amounts, the U.S. is the largest generator of waste of any nation on earth, the U.S. is least engaged in any of the above-mentioned activities (Hershkowitz 1998).

Using recycled materials helps avoid the air and water pollution typically caused by manufacturing plants that solely rely on unprocessed virgin raw materials. Recycling materials reduces the need to process and refine the raw materials for paper, plastics, glass, and metals. Recycling lessens the toxic air emissions, effluents, and solid wastes that these manufacturing processes create. Moreover, timber harvests, for instance, would have to increase 80% over current levels without recycled fibers (Hershkowitz 1998), an example of its influence on virgin resources and the entire 'ecoscape'. Recycling also impacts energy production by saving more of it relative to the incineration of wastes for energy recovery. Aside from these indirect effects, recycling has direct positive effects related to health and ecological risks associated with human household and industrial waste.

Landfills generate hazardous and uncontrolled air emissions and threaten surface and groundwater supplies. They have contaminated aquifer drinking water supplies, wetlands, and streams throughout the U.S. The list of toxic and hazardous chemicals emitted

as gas or leaking as liquid from thousands of landfills defines a waste management option with wide-ranging pollution impacts.

As Americans learned of these serious environmental problems posed by the disposal of certain materials – batteries, yard wastes, tires, etc. – into landfills, recycling began to proliferate. The management of garbage became more complicated. As entrepreneurs and environmentalists demanded that valuable, useful, or dangerous materials in the waste stream be separated for reprocessing or marketing, the logic of municipal waste collection shifted in many communities. Operating budgets and administrative procedures relating to sanitation programs were modified.

The media began to turn more proactive as well. What has previously been labeled a "non-event" had evolved into something that could be captured with pictures and personal stories, showing the risk affiliated with anti-recycling behavior. As a result recycling stories and stories of risks due to unchecked waste dumping became more numerous. Since recycling is part of a larger web of interwoven economical, political, legal, and cultural issues, the rate of recycling differs from state to state and community to community within a state.

The execution of the recycling task has normally been placed in the jurisdiction of a local municipality. In a response to escalating waste problems many states and municipalities have issued legislation that typically includes mandated curbside collection programs of recyclable goods. However, these mandates effectively removed the voluntary cooperation aspect of recycling for those communities.

Recycling in Florida

In Florida, curbside recycling activities are voluntary. The state of Florida is actually a leading state on recycling. It is currently tied for third place with Tennessee and Wisconsin, after Minnesota and New Jersey respectively, in the percentage of municipal waste that gets recycled (EPA Data 1999). Florida's 67 counties show differing rates of accomplishing the average statewide recycling goal of between 35 and 40% of all waste. While more rural areas with low populations and infrastructure (Dixie County, Indian River County) tend to be the low recycling candidates, and urban centers (Miami-Dade County, Duval County) the leaders, there are surprising differences from that norm. The top recycler in the state is Lee County (Ft. Myers), while the Tampa-St. Petersburg metro area (Hillsborough and Pinellas Counties) as well as the capital city of Tallahassee (Leon County) rank in the lower midfield, despite equal ordinances by the respective state department (Department of Environmental Protection 2001).

It is the local municipality's responsibility to provide special bins at no cost to the household, which would then put those bins out alongside the regular garbage receptacles on collection day. There is some evidence that this approach has met with consumer acceptance. Sixty to eighty percent of the eligible households (usually single unit homes) in communities such as Jacksonville, Fort Myers, Daytona, and Gainesville participate in the program. Computed over the entire community's population, this roughly translates into the targeted acceptance rate of 30 to 40% (Department of Environmental Protection, 2001). These statistical averages cannot accurately reflect and demonstrate a unified recycling participation rate within even the high-scoring communities. It constitutes, among

others, a reason for why communities and companies are still searching for better approaches to change recycling behavior.

Waste haulers, the companies hired by a local municipality to pick up household waste, have been in a unique position to become functionaries in these channels, as a result of this acceptance rate. For example, in North and Central Florida, Waste Management Inc., a major solid waste hauler, has formed a subsidiary, Recycle America, to implement curbside collection contracts with local municipalities. "The process involves the use of specialized, compartmentalized collection vehicles and also the operation of a centralized municipal reclamation facility (MRF), which is sponsored by a consortium of local governments. The MRF is the central receiving facility, at which sorting, packaging (baling, densification, etc.), and marketing activities take place. Since the geographic coverage of waste-hauler contracts is often extensive, these systems can generate significant steady volumes of materials over time" (Fuller and Allen 1995).

Recycling Research

Waste management issues have become a key concern of the government, the private sector, and the general public (Taylor and Todd 1995). People appear sensitive to environmental issues, and many seem to hold positive attitudes toward environmental programs. Despite these positive attitudes, participation in different voluntary waste management programs varies widely (McCarthy and Shrum 1994). Notwithstanding a growing literature on the behavioral research on recycling (Ebreo 1999; Shrum et al. 1995; Stern and Oskamp 1987), little is known about the factors that influence individual waste management behavior, or how beliefs and attitudes relate to behavior. According to Shrum, Lowrey and McCarthy (1994), most studies examine only a small number of

variables and create models that lack integrative power. In an attempt to build more theoretically integrated models to understand the relationship between beliefs, attitudes, and behavior, more personality and values variables have been used recently (Guttierez 1996; Park et al. 1998; Thogersen 1986;).

"Unfortunately, personality variables (e.g., altruism) are seldom actionable from a public perspective. More direct measures of recycling concern and recycling knowledge seem to be more salient means of segmentation and may result in improved marketing strategies. In addition, much of the existing research has operationalized ecological concern in terms of attitudinal responses about environmentally sound activity, e.g., the use of recycling centers. However, since progress toward solving environmental problems is likely to be dependent on pro-environmental behaviors more so than ecological consciousness (Van Liere and Dunlap 1981), researchers should focus on consumers' actions with respect to the environment [here: recycling] rather than simply their attitudes [here: clean, safe environments]. Recent investigations have used multiple measures of ecological concern that include some behavioral component. Unfortunately, these behavioral measures often tap consumers' purchase activities to the exclusion of other forms of ecologically sound behavior (e.g., conservation activities)" (Polonsky et al. 1995). The recycling discussion in the industry has focused on the biodegradability and bio-safety of the organic product or packaging in stores rather than the recycling activity itself.

Most recycling models have analyzed the cognitive (attitudinal) antecedents or dispositions believed to guide the behavior (Hopper and Nielsen 1991; Kok and Siero 2985; Vining and Ebreo 1992). The most popular model in attitude research on recycling behavior has been the Theory of Reasoned Action (Thogersen 1996).

Theory of Reasoned Action

Definition

Throughout the history of social psychology the concept of attitude has played a major role in explaining human action, viewing attitudes as behavioral disposition (Ajzen and Fishbein 1980). Since the early 1900s a number of theories have been developed to provide a framework for the attitude-behavior relationship that would provide explanatory and predictive information.

Despite concerns by some, e.g., Allport (1935), early studies seemed to confirm the validity of unidimensional effects of attitudes on behavior. Findings, such as the one by LaPiere (1934), raised doubts about this assumption. With the accumulation of negative results, alternative influences on behavior and explanations for the failure of attitude as a predictor were needed. "By the late 1950s, a multicomponent view was adopted and attitudes were viewed as a complex system comprising the person's beliefs about an object, his feelings toward the object, and his action tendencies with respect to the object" (Ajzen and Fishbein 1980).

One such theory, the theory of reasoned action (Fishbein 1967; Fishbein and Ajzen 1975), suggested that a person's behavior is determined by his intentions to behave in a specific way. His intention is, in turn, influenced by the person's attitude toward the behavior and the perception of social pressures imposed to perform the behavior (Ajzen and Fishbein 1980) (Figure 2-1)

Behavioral intention represents an individual's motivation to attempt to engage in a certain behavior. The stronger a person's intention to perform the behavior, the greater is the likelihood that it will happen. For instance, if the resident of a given city states that

he/she is extremely likely that he/she will recycle glass bottles, then it is conceivable that he/she will ask for recycling bins and dispose of all empty glass bottles separate from the other household waste.

The attitude toward performing the behavior is on average measured with a simple method of the semantic differential. Attitudes toward a concept in the model are regarded as the person's feelings of favorableness or infavorableness for that concept. The perception of social pressures, also known as subjective norms, deals with the influence of the social environment on intentions and behavior. It refers to and asks for a person's perception that important others (known as referents) think that the person should or should not perform the behavior in question (Fishbein and Stasson 1990).

Attitudes toward the behavior are determined themselves by behavioral beliefs and evaluations of consequences, emanating from those beliefs (Figure 2-1). It is important to note that within this model the object of the belief is the behavior of interest and the associated attribute is a consequence of the behavior. The interest is not in a person's beliefs about, say, the "church", but rather in the person's beliefs about "attending church this Sunday". According to Fishbein and Ajzen (1975) these are the only attitudes that are directly relevant for predicting and understanding human behavior. As defined by Ajzen and Fishbein (1980),

> "Attitudes are based on the total set of a person's salient beliefs. People usually believe that performing a given behavior will lead to both positive and negative consequences; their attitudes toward the behavior correspond to the favorability or unfavorability of the total set of consequences, each weighted by the strength of the person's beliefs that performing the behavior will lead to each of the consequences" (p. 67).

Subjective norms are also a function of a person's beliefs, but in this case they are not behavioral, but normative beliefs. They are measured by multiplying a person's belief

that specific referents think he/she should (or should not) perform the behavior with the person's general motivation to comply with each referent (Figure 2-1).

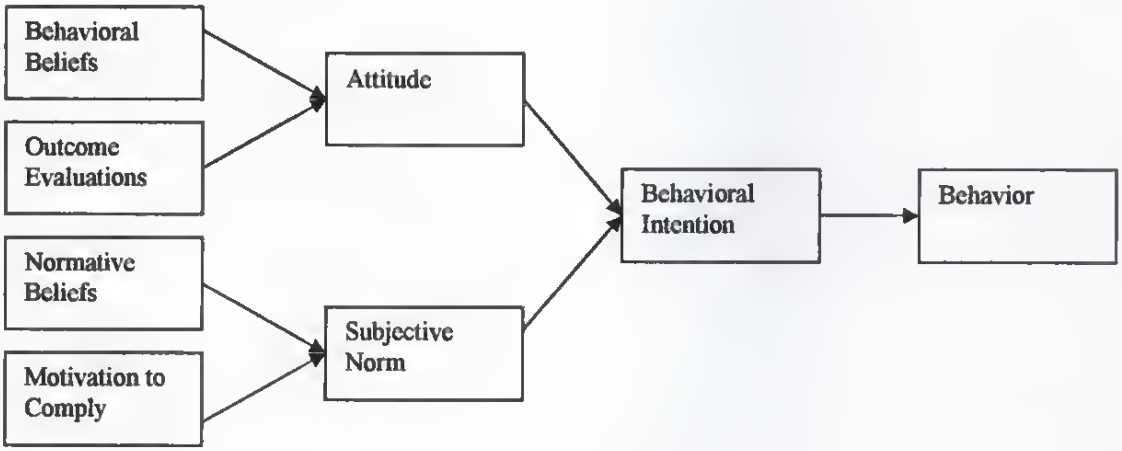

Figure 2-1. Path model for the Theory of Reasoned Action

Ajzen and Fishbein (1980) do not deny that other variables, such as age, education, or personality traits, may be related to behavior. Unlike other behavioral theories they argue that "external variables will be related to behavior only if they are related to one or more of the variables specified by our theory" (p. 82). The fields of social issues and altruism, for instance, are areas, where personal traits are frequently used. Ajzen and Fishbein argue that discussed personality traits are too generic to relate them to a specific behavior. Personality traits (or value orientations) are usually viewed as a predisposition toward a class of behaviors (e.g., aggressiveness, caring behaviors), but not any specific action. While someone might, for example, be generally pro-environmentally predisposed, that same individual might still not recycle. However, Ajzen and Fishbein do grant the question about the origins of behavioral beliefs (1980, see p. 90).

Application in Recycling Research

The Theory of Reasoned Action has been used successfully in the past 20 years in a variety of behavioral outcome or intention research, both in naturalistic and experimental settings. A number of studies have examined the predictive power of the model to explain particular behaviors, as well as tested correlations between the variables in the model. The theory was, for instance, used to explain reenlisting in the military (Shtilerman 1982), voting behavior (Fishbein, Jaccard, Davidson, Ajzen and Cohen 1980), having an abortion (Smetana and Adler 1980) and breast-feeding vs. bottle-feeding of babies (Manstead et al. 1983).

Within the realm of recycling behavior the theory of reasoned action has been used to explain the influence of education on recycling intentions of students (Goldehar 1991), the differences in recycling behaviors between ethnic subgroups (Gamba 2000), and the relationship of self-perceptions on recycling behavior (Park, Levine and Sharkey 1998). Two of these studies have applied the Theory of Reasoned Action with success to explain recycling behavior, the third (Gamba 2000) found less support for the theory.

Goldenhar (1991) conducted two studies testing the influence factors on recycling of college students, specifically those that live in on-campus dormitories. In the first study, she tested in a decision-making model, how well the theory explains recycling behavior. In the second study she incorporated two types of interventions (educational and feedback), which were developed to modify recycling attitudes, beliefs, and behavioral intentions, in order to enhance recycling behavior. A questionnaire comprising the concepts of the Theory of Reasoned Action was administered to 4,682 first-year students at The University of Michigan. Baseline data were gathered from 3,706 out of 4,682 stu-

dents (80% response rate). Of those 3,706 students, 1,604 students also completed the follow-up questionnaire (34% response rate overall). For her second study she used a quasi-experimental design over eight residence halls to match them on size and randomly assign them to one of four intervention conditions (two halls per group): (1) recycling education, (2) feedback about recycling behavior, (3) education plus feedback, or (4) control. The intervention period lasted 5 months. Path analysis, used in the first study, indicated that the Theory of Reasoned Action was useful in explaining self-reported recycling behavior. The respondents' rated importance of recycling compared to other social issues mediated the relationship between attitudes, beliefs, and behavioral intentions. Utilizing multiple comparisons in the analysis of the second study, her results showed that there were no significant group differences in terms of the students' attitudes, beliefs, rated importance, recycling knowledge, or behavioral intentions. Students receiving monthly feedback pertaining to the amount of material recycled in their residence, however, reported participating in recycling to a greater degree than those receiving only the educational intervention or nothing at all.

Park, Levine, and Sharkey (1998) examined behavioral intentions to recycle among students in Hawaii, using the Theory of Reasoned Action as a framework. Based on prior findings that attitude toward the behavior is a better determinant of intentions to recycle than subjective norms, they speculated that an individual's self-image (called self-construals in the study) will have an influence on the weight of attitudinal and normative influence on intentions to recycle. Accepting the original theory, the interest of Park, Levine, and Sharkey lies not so much in the relation between attitude toward the behavior and subjective norm, but in the relative weight of each component in the theory.

Based on results from previous studies that found gender differences for condom use (Greene, Hale, and Rubin 1997) and cultural differences between countries for product purchase influences (Lee and Green 1991), Park et al. hypothesized that one's self-perception in relation to others influences the attitude and norm variables of the Theory of Reasoned Action. Data were gathered from 201 undergraduate students enrolled in upper division classes at the University of Hawaii with a diverse ethnic makeup (25% Japanese, 18% Chinese, 14% Caucasian, 13% Filipino, 7% Hawaiian, 2% Hispanic, 2% African-American, 19% other) to determine if the different culturally imposed self-images have indeed an influence on recycling intentions.

While the researchers found that their test of the Theory of Reasoned Action supported the original predictions of the theory, the data were not consistent with the hypotheses raised involving self-construals. Instead, self-construals had direct effects on the attitudes toward behavior and subjective norm measures. In other words, even though self-construals affected attitude toward behavior and subjective norm, they did not influence either the relation between the two components or the relative weight of the two components in predicting behavioral intention. Systematic effects on subjective norm, however, revealed an effect of self-construals. The more interdependent one's self-construal was – that is, the more one aligns one's self-image with expectations and values of others (a concept closely related to the "locus of control" idea) – the higher the scores were on subjective norm. Park et al. (1998) found that "these higher scores were a function of higher scores on motivation to comply" (p. 203). Though the data were not consistent with their original assumptions of an influence of self-construals on the relative weight of the attitudinal and normative factors, the researchers drew an interesting con-

clusion. Since self-construals have an obvious direct influence on the motivation to comply factor, it appears that individual with high interdependent selves are more susceptible to messages targeting both attitudinal and normative components, as those individuals see the positive social consequences of recycling as more likely. Individuals high in independence would most likely be better targeted with messages, aiming at behavioral outcomes alone (p.206).

In a study that analyzed how different ethnic groups in a city engage in household recycling, Gamba (2000) used the Theory of Reasoned Action as a predictive model. He specifically examined the similarities and differences between Latino, European-American, Asian, and Filipino residents of San Francisco in their recycling attitudes, norms, intentions, and observed behaviors. A mail survey was conducted and observations of curbside recycling were made (walk-along on collection day, ride-along with collection trucks) in selected areas of San Francisco for eight weeks. Data were gathered for 1092 respondent households. Gamba found that recycling participation was relatively high and no discernable differences were found among the cultural groups. Unlike the previous studies, Gamba found less support for the Theory of Reasoned Action in his study. His regression analysis revealed less explanatory power of attitudes and subjective norms on intention to recycle (5% for subjective norm and 14% for attitude). He also found little variance in observed recycling behavior explained by a respondent's intention, although the latter did predict self-reported recycling well. He asserted that the fact that recycling participation among his sample was already high and a widespread practice in this urban area, the assumed model showed less empirical support. He also observed that the mailing of the questionnaire alone and the follow-up reminders produced a sub-

stantial observed increase in average weekly participation for all cultural groups over the duration of the study. This demonstrates the effect of making beliefs more salient in people's mind. In conclusion, he suggests that a program should emphasize an individual's intentions to recycle and basic knowledge of the program, stress the ease of participating and use simple reminders as possible intervention strategies to increase curbside recycling (p. 158).

Overall, findings from the three studies suggest that there is a relationship between an individual's recycling attitudes, beliefs, and behavior. In addition, feedback and educational intervention strategies, as well as self-images and values constructs appear useful in explaining and enhancing recycling behavior.

Based on the empirical research by Goldenhar (1991), Park, Levine, and Starkey (1998), and Gamba (2000), the following premises are suggested as a foundation for the current study's hypotheses and research questions:

1) Intentions to recycle are on average a sufficient predictor for actual recycling behavior, in case intention is measured on an aggregate level.

2) Attitudes and subjective norms about recycling are influenced by personal and cultural constructs, such as self-perceptions and values.

3) Attitudes and subjective norms alone are necessary but not sufficient determinants of recycling intentions.

Move toward the Theory of Planned Behavior

Definition

The Theory of Reasoned Action was developed explicitly to deal with purely volitional behaviors (Ajzen 1988). Problems arise, when the theory is applied to behaviors that are not entirely under a person's volitional control. A well-known case in point would be the failed attempt of people to quit smoking, although they seriously intended

to do so. Failure to enact the behavior may occur either because of a change in intentions or because performance of the behavior failed.

A number of researchers have focused on the question of volitional control (Bandura 1977; Kuhl 1981). Perhaps the best known example is the concept of internal and external locus of control (Rotter 1966). It refers to the belief that one's outcomes are either under the control of one's own behavior (internal) or under the control of such factors as powerful others or chance (external) (Ajzen 1988). Bandura (1977) introduced the concept of perceived *self-efficacy*. The concept refers to the subjective probability that one is capable of executing a certain course of action. In a somewhat related analysis of action control, Kuhl (1981) introduced the concept of state versus action orientation, a concept close to willpower. Action-oriented people are assumed to focus their attention on action alternatives and to make use of their abilities to control their performance. In contrast, state-oriented individuals focus their attention on their thoughts (their present, past, or future) rather than taking action consistent with their intentions (Ajzen 1985).

Closely related to self-efficacy beliefs is Ajzen's (1985) concept of perceived behavioral control, a variable that is defined as one's perception of how easy or difficult it is to perform the behavior (Eagly and Chaiken 1993). Ajzen (1985) states,

> "the success of an attempt to execute the behavioral plan depends not only on the effort invested (the strength of the attempt), but also on the person's control over other factors, such as requisite information, skills, and abilities, including possession of a workable plan, willpower, presence of mind, time, opportunity, and so forth" (p. 36).

Ajzen proposed an extension of the Theory of Reasoned Action, the Theory of Planned Behavior (Ajzen 1985; Ajzen and Madden 1986). The addition of the third antecedent of intention is the degree of perceived behavioral control. As a general rule, the

greater the perceived behavioral control, the stronger is the intention to perform the behavior under consideration. For example, if a person wants to recycle and thinks he or she has control over this behavior (recycling bins are readily available, there is no extra cost, recyclables can be put out together with the regular waste), the person is more likely to actually recycle (Figure 2-2).

In summary, the four directly measured variables are: (1) behavioral intention (BI), (2) attitude toward the behavior (A), (3) subjective norm (SN), and (4) perceived behavioral control (PBC). These variables form the following equation:

$$BI \sim (A + SN + PBC) = w1A + w2SN + w3PBC$$

with *w1*, *w2* and *w3* representing the relative contributions (weights) of attitude, subjective norm, and perceived behavioral control, respectively, to the prediction of behavioral intention (Ringer Lepre, 2000).

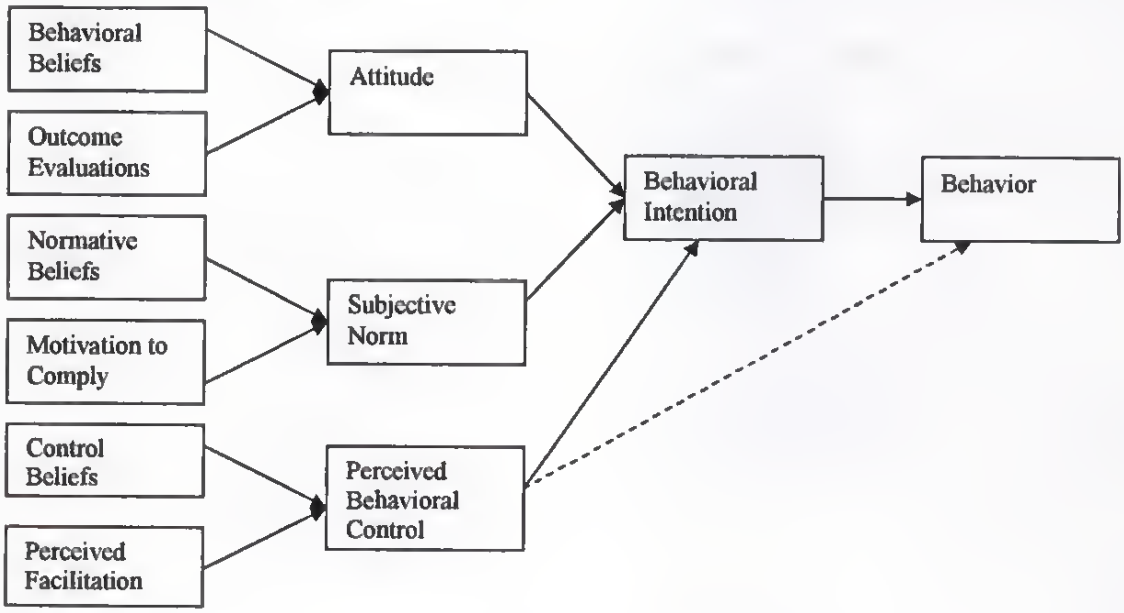

Figure 2-2. Path model for the Theory of Planned Behavior

The addition of the perceived behavioral control variable raises two interesting questions regarding its meaning and value for the model. First, perceived behavioral control is added as an exogenous variable that has both a direct effect on behavior and an indirect effect on behavior through intention. According to the construction of the original Theory of Reasoned Action, Ajzen and Fishbein (1980) argued that "the effects of external variables are mediated by beliefs, and therefore, taking external variables into account is not expected to improve prediction of intention (...) or behavior" (p. 91). Since the addition of the control variable does improve the prediction of intentions, it seems to open the door for the addition of other "external" variables that could strengthen the model.

Second, Ajzen's claim of perceived behavioral control's synonymity with self-efficacy as defined by Bandura (1977) has met with criticism (Fishbein and Stasson 1990). These studies assert that self-efficacy is a more internally based notion within an individual. This contrasts with perceived behavioral control which includes an influence by others or events. It should be plausible to allow for other internally-located factors next to self-efficacy, such as willpower, interest, or ascription of responsibility, to flow into the measure of perceived behavioral control. Finally, there seems to be some merit to divide the perceived behavioral control variable into an external component (as defined by Fishbein and Stasson (1990)), and an internal component (as defined by Bandura (1977)). This would not influence the original theory substantially. Both of the other two crucial variables – attitudes and norms – are likewise comprised of two antecedent components that form this variable.

More research seems needed at this point to clearly determine the appropriate measure for use in the theory of planned behavior. There seems to be some value in including measures of both external and internal control elements.

Based on the theoretical underpinnings of the Theory of Planned Behavior (Ajzen 1985), the following premise can be introduced as a foundation for this study's research questions:

4) With the addition of the perceived behavioral control element in the Theory of Planned Behavior the predictive power of the original Theory of Reasoned Action model is increased, allowing for cases in which the behavior (recycling) is not under complete volitional control.

Application in Recycling Research

Similar to the Theory of Reasoned Action, the Theory of Planned Behavior has been used in multiple studies to explain behavior. Ajzen and his colleagues (Ajzen and Madden 1996; Schifter and Ajzen 1985) were among the first to empirically test the theory. These studies dealt with weight loss and class attendance topics. In either case the new variable of perceived behavioral control showed strong predictive power in explaining intention to behave in a certain way. The overall predictive ability of the Theory of Reasoned Action was substantially improved. As a result, the Theory of Planned Behavior appeared to be an improvement over the Theory of Reasoned Action to explain intention and actual behavior.

In the area of recycling and green consumerism, two studies applied the Theory of Planned Behavior to explain the antecedents of recycling and composting intentions within an integrated waste management behavior model (Taylor and Todd 1995), and the influence of self-identity on attitudes and intentions to engage in shopping for organic products (Sparks and Shepherd 1992).

Sparks and Shepherd (1992) based their study on reports that a relationship exists between self-identity concepts and behavioral intentions that is independent of the role of attitudes toward the behavior or social norms. Since all these studies seemed to have been discussed in reference to the Theory of Reasoned Action, Sparks and Shepherd hypothesized that the concept of self-identity could be covered well by the added variable of perceived behavioral control. In other words, an adequate operationalization of the components of the Theory of Planned Behavior would result in no independent relationship between a measure of self-identity and a measure of behavioral intentions.

To test the hypothesis, 236 randomly sampled members of the general public in a medium-sized town in England returned a mailed questionnaire. The questionnaire included the standard variables of the Theory of Planned Behavior (salient beliefs, outcome evaluations, attitudes, subjective norm, perceived control, and intentions) as well as measures of identification with green consumerism and health-consciousness and a "green concern" index. Contrary to their expectations, the analysis revealed a substantial independent effect for self-identity, an effect that persisted when a measure of past consumption was included in the equation. They tentatively concluded that psychological identification (pro-environmental self-concept) reflects more than an inference from past behavior and acts as more than an index of values concerning external consequences of action (p. 394).

This, in turn, supports proposals that both the Theory of Reasoned Action and the Theory of Planned Behavior need to take account of the role of self-identity in influencing behavioral intention. While both the Theory of Planned Behavior and the Theory of Reasoned Action were successfully replicated, the above issue raises questions for mod-

els of attitudes based on "expected utility" because choices seem to be influenced by a multitude of considerations. These would include the socially or culturally fashioned symbolic meanings of those choices, such as the social identities that the choices might help to confer (p. 397). Identity-related symbolic outcomes that are supported by different choices would likely be of great importance to people and their particular social milieu (Giddens 1991).

Within the concept of the Theory of Reasoned Action and Theory of Planned Behavior, attitudes are formulated on the basis of utilitarian outcomes. These outcomes are the result of a cost/benefit analysis of the individual. A closer examination of how attitudes relate to subjective expected utility underpinnings of the Theory of Reasoned Action and Theory of Planned Behavior is needed. There may be evidence to either question the usefulness of the measured attitudes, or add an antecedent dimension to the model that can sufficiently explain the formation of those attitudes.

Taylor and Todd (1995) were concerned primarily with the critique that the recycling behavior literature lacks an integrated theoretically based model to understand the relationships between environmental beliefs, attitudes, and behavior (Hopper and Nielsen, 1991). Taylor and Todd created an integrative model, based on the Theory of Planned Behavior, which also included perceived innovation characteristics (Rogers 1983), facilitating conditions (Triandis 1979), and self-efficacy (Bandura 1977) as key determinants of recycling intentions and behavior. The latter two variables were positioned as direct antecedents to Ajzen's perceived behavioral control variable within the model. The first variable is based on beliefs about the perceived characteristics of an innovation (Rogers 1983).

According to the innovation literature, three perceived characteristics of an innovation have been found to influence adoption behavior: relative advantage, complexity, and compatibility. Since relative advantage and complexity have been found to be important predictors of attitude, Taylor and Todd expected those characteristics to influence attitude formation in the context of the Theory of Planned Behavior. Compatibility, a component of facilitating conditions (Triandis 1979), was estimated to influence perceived behavioral control. In the altered design of the Theory of Planned Behavior model, relative advantage refers to the degree an innovation provides benefits that supersede those of its precursor (a concept consistent with the notion of perceived costs and benefits). Complexity represents the degree to which an innovation is perceived to be difficult to understand and use (p. 611). Among the new three control variables, forming the perceived behavioral control structure, facilitating conditions relate to access to resources necessary to perform the behavior. Self-efficacy correlates to the perceived ability to carry out the behavior. Perceived compatibility is defined as the degree to which the innovation fits with the potential adopter's existing values, lifestyle, previous experiences, and current needs (p. 612).

After pilot-testing the constructs, data were gathered through a survey over 761 respondents in a mid-sized city for both recycling and composting intentions. Both fit statistics and path analyses suggested that the integrative model explained the assumed functioning of recycling intentions well. Taylor and Todd 1995) pointed out that intentions to recycle were positively influenced by attitude and perceived behavioral control, but were negatively influenced by subjective norm. The somewhat surprising result in regards to

the subjective norm was assumed to be due to the relative maturity of the recycling program.

This argument was also raised by Gamba (2000) as a potential interpretation of his inconclusive findings regarding the Theory of Reasoned Action effects on household recycling. Normative influences were important determinants of subjective norm, explaining 75% of its variance (p. 620). Finally, efficacy and resource-facilitating conditions were positively related to perceived behavioral control, though compatibility was not. Taylor and Todd argue that although recycling does not seem to be perceived by people as being compatible with their daily routines or lifestyles, it did not weaken the control they felt over their behavior. It suggests that, given adequate knowledge, people may be willing to overcome personal inconvenience to realize the more global benefits of recycling (p. 620). Taylor and Todd maintain that while the original Theory of Planned Behavior is a useful starting point, the integrated waste management model can provide a better understanding of the complex relationships that influence waste management intentions and subsequent behavior.

Based on these empirical research studies, applying the Theory of Planned Behavior, the following premises are added as foundations for this study's hypotheses and research questions:

5) The addition of perceived behavioral control in studies predicting recycling intentions and behavior has shown to improve predictability of the Theory of Reasoned Action.

6) Attitude, subjective norms, and perceived behavioral control all seem to provide equally significant explanatory power for behavioral intentions and behavior.

7) A stricter separation of the perceived behavioral control variable into control beliefs and perceived external facilitation conditions will strengthen this variable.

8) The inclusion of antecedents to the attitudinal, normative, and control beliefs in the form of self-concepts or personal values has been found to improve predictive ability of the entire model.

Personal Values and Recycling

Introduction

As the two empirical studies using the Theory of Planned Behavior have shown, a growing number of researchers have begun to study the development of environmental attitudes as well as underlying cultural or personal values systems, influencing recycling behavior directly. Research streams emerged from the literature on norm activation theory, perceived risk, self-concept effects, psycho-social variables, and the new environmental paradigm (NEP). Each stream can be considered a relatively large autonomous field of its own. Together they may be viewed as parts of a larger, more generalized framework, which incorporated ideas about nature of values proposed by Schwartz (1977, 1992) and Rokeach (1973, 1979). Schwartz's theories have been applied by Stern (1987, 1992) within the context of environmental concern research (Young 1997). The following discussion assesses values research and explains and defends its use in a modified model of the Theory of Planned Behavior within the current study. This will provide a conceptual framework.

Values Research

Values and norms can predispose individuals to hold certain attitudes and react in predictable ways toward environmental problems (Dunlap and Van Liere 1978; Stern, Dietz and Kalof 1993). It seems that there are compelling theoretical reasons for assuming that the study of a person's values is likely to be useful. The study will use the definition of Rokeach (1973), who stated:

> A value is an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence. A value system is an enduring organization of beliefs concerning preferable modes of conduct or end-states of existence along a continuum of relative importance (p. 5).

The key elements of this definition are comprised of the words "enduring", "belief", and "end-state of existence". The endurance quality of a value stems from the fact that a value is learned initially in isolation from other values in an absolute manner. One can, to use the example of "honesty" as a value, not be just a little honest. At the same time, one can also not be sometimes honest, and sometimes not. Honesty, as an example for an end-state of existence, is always desirable over others. Although people learn through experience and maturation to integrate values into a hierarchical system, the behavioral outcome in a specific scenario will be determined by the relative importance of a specific value compared to others. For example, honesty as a value might be subordinated to another value (say: freedom), if this value is seen as more important in the situation, but it will never be compromised in its own right.

A value is also considered a prescriptive, or proscriptive, belief, or "a belief upon which a man acts by preference" (Allport 1961). Values have cognitive, affective, and behavioral components (Rokeach 1973). "It has a behavioral component in the sense that it is an intervening variable that leads to action when activated" (Rokeach 1973, p.7).

The distinction of beliefs toward a *mode of conduct* versus *end-states of existence* separates values into two kinds: instrumental values and terminal values. Since values form a functionally interconnected system, once they are internalized, subsequent values research (Kahle 1984; Schwartz 1992) has not maintained this strict separation.

Values researchers have concluded that values are multi-faceted standards. Values help individuals to rationalize beliefs, attitudes, and behaviors that would otherwise be personally or socially unacceptable so that one will end up with personal feelings of morality and competence, and in the end enhanced self-esteem.

An attitude refers to an organization of several beliefs around a specific object or situation (Rokeach 1968). In contrast, a value refers to a single belief of a very specific kind. Attitudes are focused on some specified object or situation, while values transcend them. Since values are also considered standards, applying to all kinds of situations, they are believed to occupy a more central position than attitudes within one's personality makeup and cognitive system. Values are determinants of attitudes as well as behaviors.

Values also differ from social norms. A value refers to an end-state of existence and transcends specific situations. In contrast, a social norm refers to only one mode of behavior connected in a prescriptive fashion to a specific situation. For example, Navaho Indians should refrain from having ceremonials at the time of an eclipse of the moon (Kluckhohn 1951). This behavior is subject to sanctions from the Navaho society, and only apply to the eclipse scenario. Second, a value is more personal and internal, whereas a norm is consensual and external to the person (Rokeach 1973).

It can be assumed that values may have a rightful place as antecedents to beliefs, attitudes, norms, and actions in a model, such as the Theory of Planned Behavior.

Schwartz Values Model

Schwartz (1970) proposed that people are aware and concerned with others' well-being and consequently act out of a sense of moral obligation to help others. In other words, they act altruistically. "These moral norms may be internalized wholly or par-

tially, or they may be perceived as expectations held by significant others" (Schwartz 1970, p. 130). Schwartz's term for a non-internalized norm is "social norm", which is defined the same as in the Theory of Reasoned Action. His term for an internalized norm is "personal norm". He referred to it as "internalized values" (Schwartz and Howard 1980).

People, who, e.g., hold a great concern for the environment, generally have a great concern for others' welfare as well. If they are aware of adverse consequences to others, as a result of their behavior, they behave in a pro-environmental fashion. They will do so as well, if they ascribe a personal responsibility to themselves to act altruistically and reduce the negative consequences. Thus values influence behavior when they are activated by situational concern (Karp 1996).

Schwartz (1992, 1994) extended his research on values, administering a global survey with Likert-type questions that inquired on the importance of 56 value items as "guiding principles" in respondents' lives. His new theory of values was predicated on the Rokeach scale. He identified ten motivational goals (e.g., conformity, security, hedonism), which were further collapsed into four identifiable clusters, representing the extremes of two basic conditions (Young 1997). This is illustrated in Figure 2-3.

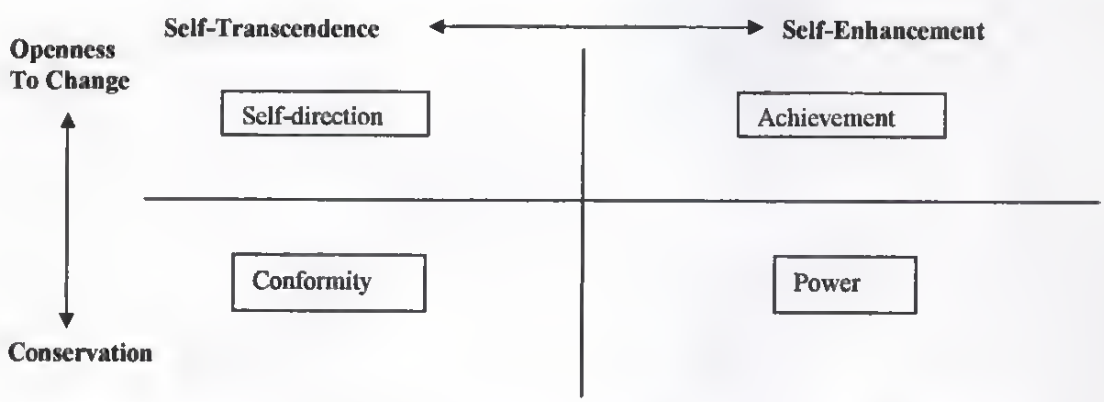

Figure 2-3. Schwartz values dimensions (with 4 exemplary motivational types)

The openness to change versus conservation dimension indicates the degree to which individuals are motivated to independent action and willing to challenge themselves for both intellectual and emotional realization (Karp 1996).

> [The dimension] arrays values in terms of the extent to which they motivate people to follow their own intellectual and emotional interests in unpredictable and uncertain directions versus to preserve the status quo and the certainty it provides in relationships with close others, institutions, and traditions (Schwartz 1992, p. 43).

The second dimension contrasts values oriented toward the pursuit of self-interest (self-enhancement) with values related to a concern for the welfare of others (self-transcendence).

> It arrays values in terms of the extent to which they motivate people to enhance their own personal interests (even at the expense of others) versus the extent to which they motivate people to transcend selfish concerns and promote the welfare of others, close and distant, and of nature (Schwartz 1992, p. 43).

As traditionally understood, the concern for others in the environmental literature usually refers to people. However, if the subject holds "ecological values", there is no reason why the "other" could not be nonhuman (Thogersen 1996). Consequently, some scholars include "biospheric altruism" – behaviors judged with reference to ecological values – within the domain of morality (Stern, Dietz and Kalof 1993). Overall, Schwartz's work on individual values will be used as a basis for the current study in regards to environmental values, related to recycling.

Applications in Environmental/Recycling Research

The Theory of Reasoned Action and the Theory of Planned Behavior have become the most popular analytical framework for recycling and more general proenvironmental research. Both are a variety of Subjective Expected Utility (SEU) models that as-

sume that action is motivated by a desire to maximize private utility (Thogersen 1996). The general assumption for recycling research was that action is indeed either triggered by selfish motives (gains, cost avoidance) or adherence to accepted social norms in the society. Scholars, such as Thogersen (1996), have argued that recycling should be treated as an instance of prosocial behavior, because of its benefits to society and the environment.

> "In affluent industrial societies, environmental behaviors like recycling are typically classified within the domain of morality in people's minds. Attitudes regarding this type of behavior are not based on thorough calculation, conscious or unconscious, of the balance of costs and benefits. Rather, they are a function of the person's moral beliefs, that is, beliefs in what is the right or wrong thing to do" (Thogersen 1996, p.537).

This alternative, theoretical approach that seeks to explain behavior with values and morality has been applied in studies, testing Schwartz's altruism model (Guagnano, Stern and Dietz 1995; Hopper and Nielsen 1991; Vining and Ebreo 1992), and more ad-hoc based models (Derksen and Garttrell 1993; De Young 1986; Stern, Dietz and Kalof 1993). Two studies applied the concept of proenvironmental values and personality traits directly to explain proenvironmental behavioral intentions. Karp (1996) analyzed the influence of value orientations on the intention to protect the environment. Allen and Ferrand (1999) applied the influence of Geller's concept of "actively caring for the environment" (1995) to determine proenvironmental behavior.

Karp (1996) based his study on Schwartz's theory and measure of values (1992), accepting the assumption that values play a role in specific situations when activated by a set of altruistic concerns. The idea of an impact for specific situations was criticized by attitude theory (Ajzen and Fishbein 1980). Subsequent studies (Stern and Dietz 1994) have demonstrated that values are a good predictor of specific behaviors. The goal of

Karp's study was to clarify the role of values in predicting environmental behavior by using a complete Schwartz Scale of Values to test the effect of values. Values are arrayed along two dimensions, one spanning between self-enhancement and self-transcendence, another spanning between openness to change and conservation. Within this 2x2 values dimension matrix exist ten value categories, called motivational types by Schwartz. Those include values, such as benevolence, security, power, and hedonism, among others. Karp hypothesized that individuals, who hold self-transcendence and openness to change values are the most likely to engage in proenvironmental behavior. Those that combine self-transcendence with conservation values engage in proenvironmental behavior, if based on a normative standard (rules).

Finally, those that hold self-enhancement values are less likely to act in a proenvironmental fashion. This behavior is only modified by the openness to change dimension. Openness to change might lead self-enhancement individuals to engage in proenvironmental behaviors, if there is a link to self-interest, e.g., buying organic food for health reasons (p. 116). In the study Karp conducted, he measured values along the Schwartz (1992) Scale of Values (a 9-point scale, ranging from "opposed to my values" to "of supreme importance to me") and proenvironmental behavior on a self-reported scale of activities (a 5-point scale, ranging from "never" to "always"). Through factor analysis the behaviors were reduced to three categories, called "Good Citizen" (frequent proenvironmental behaviors), "Activist" (infrequent proenvironmental behavior), and "Healthy Consumer" (targeted proenvironmental behavior).

The main finding of the study was that the effect of self-transcendence and openness to change, as well as a biospheric motivation type, has a strong positive effect on all

three categories of environmental behavior. The other combinations of values dimensions, however, were not fully supported by the findings, except for the extreme opposite values combination to the above (self-enhancement and conservation), which showed a negative effect on the composite behavioral category as well as the "Activist" category.

Overall, Karp found that an understanding of the relationship between values and behavior increases the likelihood of determining what triggers people to engage voluntarily in proenvironmental behaviors. This would help to engage in programs that promote noncoercive solutions to problems rather than forcing a behavior to avoid a free-rider effect. Since the findings were no entirely conclusive, Karp suggests that in addition to using values alone, one should consider addressing rational considerations (perceived individual efficacy, estimation of consequences) as well (p. 131). This suggestion does point to the usefulness of a merging of two theory streams – a theory based on rational choice, such as the Theory of Planned Behavior, with a values-based theory, such as the Schwartz model.

Related to the idea of perceived efficacy is the concept of actively caring, developed by Geller (1995). The actively caring perspective is analogous to the concept of self-transcendence (Maslow 1971; Schwartz 1992). Actively caring explains behaviors, executed to benefit others, make others feel better, or influence other's behavior in a desired direction (Geller 1995). Geller developed a model of actively caring, a form of altruistic motivation that primarily looked at the psychological internal determinants of an "actively caring" attitude. Geller's actively caring variable mediates the relationship between environmentally responsible behaviors and personality factors related to self-affirmation (self-esteem, belonging, self-efficacy, optimism, and personal control).

Allen and Ferrand (1999) tested this hypothesis empirically in a study on 121 students in New York. Although Geller's model is related to Schwartz's norm activation model of altruism (1977), it contains specific precursors lacking in the Schwartz model. In addition, unlike the Schwartz model, which includes an adherence to a social norm, Geller's notion of caring is directly arrived from an internal feeling of sympathy and personal psychological makeup. Hence, data testing Schwartz's model would be inconsistent with Geller's hypothesis (Allen and Ferrand 1999, p.341). The purpose was to directly test Geller's model.

Allen and Ferrand (1999) asked 121 undergraduate students at a liberal-arts college in New York to fill out a lengthy questionnaire that assessed self-esteem, feelings of belonging, sense of personal control regarding environmental problems, sympathy for others, and the extent to which they engaged in a variety of environmentally friendly behaviors. To measure the predictors, existing scales were used, whenever possible, from previous research. Personal control was measured with the Environmental Action Internal Control Index (Smith-Sebastano 1992). Self-esteem was measured using the Texas Social Behavior Inventory (Helmreich, Stapp and Ervin 1974). Belonging was measured using the Social Connectedness Scale from Lee and Robbins (1995). Since Geller had not identified a specific measure of actively caring, the researchers chose Davis' (1983) measure of sympathy.

Path analyses were conducted to test the mediational aspect of Geller's model (p.344). Allen and Ferrand's findings suggest that sympathy is an important predictor of environmentally responsible behavior. Sympathy is facilitated by feelings of personal control, which supports Geller's notion that actively caring mediates the relation between

self-affirmation factors (e.g., personal control) and environmentally friendly behavior. Unlike personal control though, self-esteem and belonging did not predict environmentally friendly behavior well. The researchers speculated that their measure of personal control was the one, most specifically related to environmental problem solving and concern. People felt specifically empowered or self-affirmed in relation to environmental issues. If it is the case that self-empowerment feelings unlike self-affirmation goals need to precede dispositional factors to predict behavior, Geller's theory (1995) does not explain actively caring properly and needs to be changed.

Similarly to Karp (1996), Allen and Ferrand caution as well to interpret their findings in a way that suggests that environmentally friendly behavior is entirely a function of sympathy and altruism. As Stern, Dietz and Kalof (1993) demonstrated in finding egoistic motives in addition to altruistic motives as antecedents of environment-protecting behavior, environmentally friendly behavior appears to be multiply determined.

Based on these empirical research studies, applying the concepts of values and personality traits, the following premises are added as foundations for this study's hypotheses and research questions:

9) Value orientations seem to provide explanatory power for the origins of behavioral, normative, and control beliefs.

10) A succinct value orientation scale, such as the one provided by Schwartz, delivers adequate explanation for proenvironmental behaviors, such as recycling.

11) Perceived behavioral control is sufficiently explained by internal beliefs of empowerment (self-efficacy) and beliefs about the extent of control of external factors.

12) Values influence behavioral intention about recycling through their proximal relationship with attitudes, norms, and control perceptions.

Inclusion of Values in the Theory of Planned Behavior

Ajzen's Theory of Planned Behavior (1985) specifies in a mathematical way the relationship among beliefs, attitudes, and behaviors (Petty and Cacioppo 1981). The theory is based on the assumption that "humans are rational animals that systematically use or process the information available to them" and that "the information is used in a reasonable way to arrive at a behavioral decision" (Ajzen and Fishbein 1980).

The assumption of rationality has a favored position in economics (Tversky and Kahneman 2000) and related disciplines. A society that is influenced by scientific thinking usually holds up the "rational choice model" of decision making as an ideal to which we should aspire (Miller 1999). In other words, when confronted with an environmental problem (such as solid waste), it is argued that we should develop a comprehensive understanding of the problem, explore all possible alternatives, engage in logical decision-making, and seek evaluative feedback on the consequences of our actions.

In practice, "rationality" can take many forms. Being rational simply means that one takes orderly steps toward achieving a reasonable coherent goal, as irrational as it might appear to a neutral observer. Rationality is simply a mental model composed of two broad sets of ideas, what people believe and value (their ideology), and how they seek to achieve their valued goals (their preferred mode of reasoning or conduct) (Miller 1999). While two different people may use different rationalities, they are similar in that their behavior is embedded in a set of values. It follows that all problem-solving behavior is subjective; it cannot be "objective" in the sense of being totally detached from personal and cultural values (p. 12).

This study does not argue that Fishbein and Ajzen assume a positivistic rationality in their theory, it appears questionable why personal values – as part of the "other variables" – should be entirely exogenous to the model and can only indirectly (through beliefs) affect behavior or behavioral intent (Ajzen and Fishbein 1980, p. 82). Deducing from the above arguments, it is possible that values can have a direct influence on behavior, as demonstrated in the results of the previously tested empirical studies. In general, researchers should consider including values as an antecedent internal variable set to beliefs with stable theoretical relations to behavior.

Furthermore, the main argument against the inclusion of personality traits – which would include values – into the model has been that a general measure of, e.g., altruism will not correlate well with any specific single behavior (p. 89). Values and attitudes are organized in a hierarchical construct that renders values the determinants of attitudes. For example, a held value, such as "a world of beauty" will be expressed in a specific situation in the form of a belief, such as "preference for a highway without litter". This might ultimately result in a behavior, such as participating in an "adopt-a-highway" program to act on the attitude. Granted, in this example the flow is sequential, and no direct value-behavior relationship is present. However, there is no reason to exclude values from the "value-belief-attitude-intention-behavior" sequence of operation, just because it is the antecedent to the following.

In their own work, Ajzen and Fishbein (1980) opened the door for questions regarding the origins of beliefs (p. 90). The current study argues that values are the origins of the beliefs and should be included in the model as an internal variable.

Proposed Model

Previous studies have demonstrated that values research applied to environmental issues, including recycling, has become more robust. The work by Stern, Dietz and Kalof (1993) incorporated Schwartz's work (1992) on universal values into a specification of environmental concern (Young 1997). The combined model – which Young (1997) has called the Stern-Schwartz model – proposes that individuals make decisions and form attitudes about environmental issues by processing these situations through a system of heuristics, where values, beliefs, and attitudes influence an individual's propensity to act. The key component for the current study is the interactive inclusion of values orientations to the attitudinal, normative, and control determinants of behavioral intention in the model of the Theory of Planned Behavior. The idea of values enhanced variables will be borrowed for use in the present study.

Value orientations underlie all beliefs, attitudes, and behavioral intentions; thus they are postulated as causally antecedents to all other variables within the modified Theory of Planned Behavior. People can hold multiple value orientations to certain degrees, which can vary across individuals. Individual attitudes toward recycling emanate from three value orientations.

First, an **egoistic value** orientation predisposes people perform a type of cost/ benefit analysis with regard to recycling. Persons take either pro- or anti-recycling stances in accordance with their assessment of the personal costs associated with the problem (Stern et al. 1993; Young 1997). This could include such actions as supporting a citywide household recycling program only if utility fees or taxes are not adversely impacted by it. Empirical work by Stern and Dietz (1994) has shown that the egoistic value

is conceptually and empirically equivalent to Schwartz's *Self-Enhancement* dimension. Literature on environmental risk rests on this value orientation in particular (Douglas and Wildavsky 1982; Wilson 1992). Kahneman and Tversky (1979) have shown that if decisions include great risk, people tend to minimize losses rather than maximize gains. This is consistent with an egoistic value orientation.

Second, an **altruistic value** orientation describes individuals' concern about the impact of the waste problem and their non-recycling behavior on others. Individuals are likely to act to reduce the negative effects. People with this value orientation recycle in order to provide long-term availability of natural resources to future generations (Young 1997). A potential behavioral intention could include an active and ongoing recycling and clean-up support of the neighborhood so that people within (e.g., children at play) are safe from pollution and run-off. Studies by Stern and Dietz (1994) have shown that the altruistic value orientation is included in Schwartz's *Self-Transcendence* dimension.

A related value, the **biospheric value** orientation, predisposes people to be concerned about the consequences of not recycling on the earth itself. This orientation is also conceptually included within Schwartz's *Self-Transcendence* dimension. Biospheric values are essentially synonymous with the New Environmental Paradigm (NEP). This worldview, developed by Catton and Dunlap (1978), understands humans as part of the natural world and governed by its rules. Recycling decisions are made as a result of concerns what non-recycling would do to the natural environment (poisoning, endangered species, etc.). Slightly different from the altruistic value orientation, behavior resulting from biospheric values could include recycling activities motivated by desires to keep the environment itself (not fellow citizens) safe from toxins and non-degradable trash. Bio-

spheric values have played a prominent role in the thinking of environmentalists (Naess 1989). Empirical analyses (Stern & Dietz, 1994) have failed to reveal a clear distinction in the general public between valuing nature in itself and valuing nature because of the human benefit. In the current study, the altruistic and biospheric orientations will be regarded as one category.

Third, a **traditional value** orientation predisposes individuals to act according to established, internalized norms and cultural paradigms. Decisions on recycling are made based on an adherence to an agreed-upon status quo within the community that a person belongs to ("this is how it's done around here"). This orientation is conceptually related to Schwartz's *Conservation* dimension. This dimension could manifest itself in a recycling behavior that is largely motivated by how someone grew up, and how the neighborhood thinks about recycling.

Finally, Schwartz' fourth dimension, *Openness-to-change*, will not be used via a related values orientation. The reason is that this dimension is implicitly part of both the egoistic and altruistic values orientation in this model.

With all other variables equal to the Theory of Planned Behavior, the proposed model is illustrated in Figure 2-4.

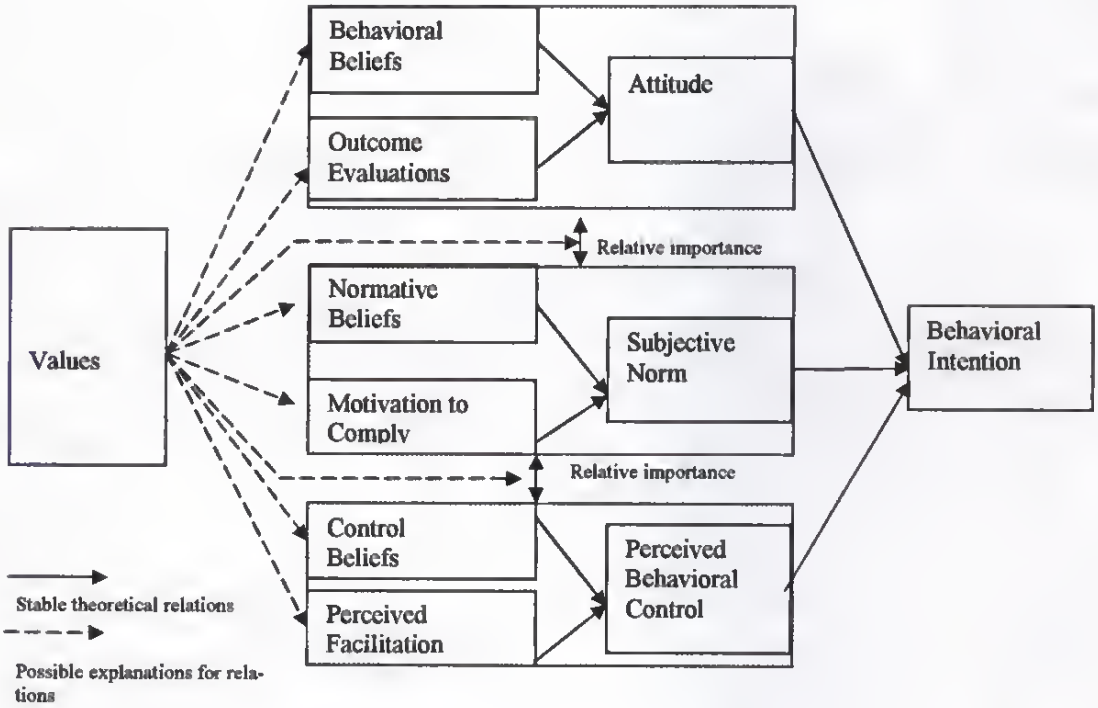

Figure 2-4. Path model for the values-enhanced model

In summary, seven variables are measured directly. They are: (1) behavioral intention (BI), (2) attitude toward the behavior (A), (3) subjective norm (SN), (4) perceived behavioral control (PBC), and (5 through 7) the values (V). These variables form the following equation:

$$BI \sim V\,(A + SN + PBC) = \alpha + \beta_1 V_{rat} A + \beta_2 V_{tra} SN + \beta_3 V_{ego} PBC + \varepsilon$$

with β_1, β_2 and β_3 representing the relative contributions (weights) of attitude, subjective norm, perceived behavioral control, enhanced by the dominant values respectively, to the prediction of behavioral intention.

Three of the determinants of intention (A, SN, and PBC) are, in turn, determined by underlying belief structures, while the values construct is determined by the most dominant values orientation. Stated formally, A is the sum of attitudinal beliefs (ab_i) multiplied by an evaluation of their outcome (e_i), that is,

$$A = \Sigma\, ab_i e_i.$$

SN is the product of the individual's normative beliefs regarding the influence of a particular referent (nb_j) and the motivation to comply with that referent (mc_j), that is,

$$SN = \Sigma\, nb_j mc_j.$$

PBC is the result of the sum of beliefs about personal control, i.e. the perceived difficulty (or ease) with which to execute the behavior, (cb_k) multiplied by the perceived facilitation of the control factor (pf_k), that is,

$$PBC = \Sigma\, cb_k pf_k.$$

Finally, the dominant values orientation that is linked to the respective determinant, is the result of the different values, an individual possesses. The subscripts $_{rat,\ ego,}$ and $_{tra}$ refer to the rational, altruistic, and traditional value orientation (V), as follows:

$$V_{rat} = (\Sigma\, v_{ego}) - (\Sigma\, v_{alt} + \Sigma v_{bio})$$
$$V_{tra} = (\Sigma\, v_{tra})$$
$$V_{ego} = (\Sigma\, v_{ego}).$$

Summary, Research Questions, and Hypotheses

Summary of the Literature

The review of the literature on pro-environmentalism and recycling provides the background and structure for the current study. Some of the most important points are summarized below:

1: Recycling is an activity that despite its social benefits and potential benefits to the individual's future well being is not done universally.

2: People cite different reasons for why they do not recycle, such as lack of opportunity, lack of knowledge, doubts about making a difference, degree of difficulty, and lack of interest.

3: Information campaigns to entice people to engage in recycling have usually focused on risks of non-recycling (fear appeal) or ease of engaging in it.

4: Research about recycling discovered that both rational and moral/ethical thoughts determine people's behavior.

5: The Theory of Reasoned Action has proven to be a model that is useful to determine and predict the variables that influence behavioral intention on recycling and proenvironmental behavior in general.

6: The Theory of Planned Behavior has proven to be a model that strengthens the determination and prediction of variables, influencing behavioral intention on recycling and proenvironmental behavior in general.

7: Values orientation has shown to determine belief and attitude orientation toward a proenvironmental behavior, including recycling.

8: Beliefs about the control over one's behavior are determined by one's inner self-empowerment thoughts as well as perceptions of control over external factors.

9: Both empirical studies, adhering to models of rationality and those adhering to altruism, suggest a strengthening of their predictive power through borrowing ideas from the opposite concept.

Premises

Throughout the literature review several premises have been proposed as a foundation for the current study. They will be used to formulate the research questions and hypotheses in the current study. Those premises are:

1) Intentions to recycle are on average a sufficient predictor for actual recycling behavior, in case intention is measured on an aggregate level.

2) Attitudes and subjective norms about recycling are influenced by personal and cultural constructs, such as self-perceptions and values.
3) Attitudes and subjective norms alone are necessary but not sufficient determinants of recycling intentions.
4) With the addition of the perceived behavioral control element in the Theory of Planned Behavior the predictive power of the original Theory of Reasoned Action model is increased, allowing for cases in which the behavior (recycling) is not under complete volitional control.
5) The addition of perceived behavioral control in studies predicting recycling intentions and behavior has shown to improve predictability of the Theory of Reasoned Action.
6) Attitude, subjective norms, and perceived behavioral control all seem to provide equally significant explanatory power for behavioral intentions and behavior.
7) A stricter separation of the perceived behavioral control variable into control beliefs and perceived external facilitation conditions will strengthen this variable.
8) The inclusion of antecedents to the attitudinal, normative, and control beliefs in the form of self-concepts or personal values has been found to improve predictive ability of the entire model.
9) Value orientations seem to provide explanatory power for the origins of behavioral, normative, and control beliefs.

10) A succinct value orientation scale, such as the one provided by Schwartz, delivers adequate explanation for proenvironmental behaviors, such as recycling.
11) Perceived behavioral control is sufficiently explained by internal beliefs of empowerment (self-efficacy) and beliefs about the extent of control of external factors.
12) Values influence behavioral intention about recycling through their proximal relationship with attitudes, norms, and control perceptions.

Research Questions

After a thorough review of the literature, it is conceivable that personal, social or traditional values can directly and indirectly influence behavioral intentions. In so doing, values related to a specific behavior could become the origin of beliefs regarding the intention.

RQ1: What roles do values orientations play in explaining recycling intention?

Furthermore, specific values orientations seem to be closely related to a particular determinant of behavior. In other words, a rational motivation to act seems to stem from a rational values base, while e.g., a behavior resulting from adherence to norms comes from a values orientation based on traditions.

RQ2: Can attitudes, social norms, and perceived control dominance in reference to recycling intentions be traced back to their specific underlying values orientations?

Finally, if the different values are connected to different determinants of intention, we could explain their effect on behavior and the origins for the respective recycling beliefs.

RQ3: Will the likelihood of recycling intentions be explained better if we include values to the belief-behavior model?

Hypotheses

After formulating the research questions, several hypotheses were developed. They are as follows:

H1: Behavioral beliefs, outcome evaluations, normative beliefs, motivations to comply, control beliefs, and perceived facilitation will predict attitudes toward, subjective norms about, and perceived control about intentions to engage in recycling.

H2: Attitudes, subjective norms, and perceived behavioral control will predict behavioral intention to engage in recycling.

H3: Attitudes and perceived control will be major predictors of intention to engage in recycling.

H4a: Egoistic value orientations will be positively related to the control component and negatively related to the attitudinal and normative components.

H4b: Altruistic/biospheric value orientations will be positively related to the attitudinal component and negatively related to the control and normative components.

H4c: Traditional value orientations will be positively related to the normative component and not significantly related to the attitudinal and control components.

H4d: Rational value orientations (the resultant value of the difference of egoistic value orientations and altruistic/biospheric value orientations) will be posi-

tively related to the attitudinal component and negatively related to the normative and control components.

H5a: The inclusion of rational value orientations to attitudes will make a significant contribution in the prediction capability of attitude for recycling intention.

H5b: The inclusion of traditional value orientations to subjective norms will make a significant contribution in the prediction capability of subjective norms for recycling intention.

H5c: The inclusion of egoistic value orientations to perceived behavioral control will make a significant contribution in the prediction capability of perceived behavioral control for recycling intention.

H6: The inclusion of values will improve the predictability of the attitudinal, normative and control variables to explain recycling intentions in the Theory of Planned Behavior.

CHAPTER 3
METHODOLOGY

This study uses survey methodology to assess differences in values, beliefs, attitudes, and behavioral intention among the sample. It is broken out into two main parts. First a correlation analysis will be conducted to confirm the hypothesized variables from the question item set and explore the relationships between the variables set forth in the theoretic part. Second, a regression analysis will be conducted to test the hypotheses and research questions.

This chapter is broken out into five sections. The first section deals with the model operationalization and sampling strategy. The second section discusses the survey design as well as variable and scale development issues. The third section analyzes reliability and validity issues regarding measurement. The fourth section explains procedures and data cleaning techniques. And the fifth section details statistical analyses.

Operationalization of the Model

The purpose of the current research was to develop and test the influence of personal values on the recycling intentions of residents in the Gainesville, Florida area, using the Theory of Planned Behavior as a guide. The model is operationalized according to the outline by Ajzen and Fishbein (1980) and its expansion by Ajzen and Madden (1986). The first three steps are more theoretical in nature, while the final two steps are empirical and necessitate the involvement of the population of interest. The five steps are as follows (Young et al. 1991):

1. Select the behavior of interest and define it in terms of its action, target, context, and time elements.
2. Define the corresponding behavioral intention.
3. Define general attitude, social norm, and perceived behavioral control. Define the values set.
4. Elicit the salient behavioral, normative, and perceived control beliefs about the target behavior from a representative sample.
5. Develop or adjust questionnaire items from the salient behavioral, normative, and perceived control beliefs.

A comparative analysis will be performed over the most recent and representative studies on recycling that have used either the Theory of Reasoned Action or the Theory of Planned Behavior (Bagozzi and Dabholkar 1994; Gamba 2000; Goldenhar 1991; Park et al. 1998; Todd and Taylor 1995). The most frequently cited beliefs are subsequently used as questionnaire items in the study. A similar analysis is performed over studies that have used values orientations (Guttierez Karp 1996; Schwartz 1992; Stern & Dietz 1994).

Sample

The context of this study is a random digit dialing telephone survey. This method was chosen as it seems appropriate for investigating recycling in a natural setting and reaching a representative sample of recyclers and non-recyclers. Since recycling services in the greater Gainesville area are primarily offered to single-family households, a study targeting a completely random population that, e.g., includes over-proportionally a population living in multi-family dwellings would skew its findings too much.

A total of 400 people will be surveyed during the last two weeks of May 2002 by telephone in the greater Gainesville, Florida area. A random-digit dialing procedure overlaid by the appropriate ZIP code classification will be used to draw from the population of all potential recycling households with working telephones, regardless of if the number was directory listed or not (Bagozzi & Dabholkar 1994). The person responsible for recy-

cling will be asked for to select a respondent in each household. Within the ordered ZIP code area, a computer-assisted method will be used to generate the last four digits of the phone number. Due to this technique the sample can be considered a random digit dialing (RDD) sample (Klecka and Tuchfarber 1978; Miller 1991).

In order to minimize Type I and Type II errors, and to be able to detect moderate levels of change, 400 respondents will be recruited, classified as the heads of household. This number was calculated in accordance with an alpha level of .05, and a range of accuracy of the estimate of plus/minus 5% within the population percentage. In other words, the 95% confidence interval should be the sample percentage plus or minus 5%. According to Kalton (1983), this specification requires that 1.96 SE(p) = 5%, where p is the sample percentage and SE the standard error. With the use of a random sample, SE(p) is the square root of PQ / n', where P is the population percentage, Q = 100 – P, and n' is the estimate of that sample size. Thus, 1.96 times the square root of PQ / n' = 5, or: $n' = 1.96^2 PQ / 5^2$.

In order to determine n', a value is needed for P. Since PQ is largest at P = Q = 50%, a very conservative choice is to set P equal to 50%. With this choice, n' = 384, which would constitute the maximum required sample size.

Survey Design

The survey instrument includes five scales. It combines elements from Stern, Dietz, and Kalof's (1993), and Stern and Dietz's (1995) previously validated instruments for the values dimensions (V), and elements from Ajzen and Fishbein's (1980) previously validated instruments for attitudes (A), subjective norms (SN), and perceived behavioral control (PCB). Subscales will be replicated directly and have shown medium to high reli-

ability, as will be reported later. The dependent measure is composed of the behavioral intention (BI) scale, also replicated from Ajzen and Fishbein (1980). The variables and scale items of the model are discussed below.

Explanatory Variables

Values are operationalized in this study by a scale that consists of 16 values items. Three of those dimensions that had been previously used in the Stern et al. (1994) study hypothesized to load on three of the Schwartz (1992) dimensions. In addition, the authors generated the 'biospheric' dimension. Borrowing from Schwartz's methodology, Question 15 of the survey instrument (Appendix, p.129f) was created using seven-point Likert-scale questionnaire items. They ask respondents if a particular value is "important" to their overall life's value system, with the scale ranging from "extremely unimportant" to "extremely important" (Schwartz, 1992). Subscale items of the four values dimensions are hypothesized as:

Factor One: Egoistic Values
V_{ego} 1 – Authority
V_{ego} 2 – Social Power
V_{ego} 3 – Wealth
V_{ego} 4 – Influence

Factor Two: Altruistic Values
V_{alt} 1 – A world at peace
V_{alt} 2 – Equality
V_{alt} 3 – Social justice
V_{alt} 4 – Helpful

Factor Three: Biosperic Values
V_{bio} 1 – Unity with nature
V_{bio} 2 – Protecting the environment
V_{bio} 3 – Respecting the earth

Factor Four: Traditional Values
V_{tra} 1 – Honoring parents and elders
V_{tra} 2 – Self-discipline
V_{tra} 3 – Clean
V_{tra} 4 – Politeness
V_{tra} 5 – Social order

Attitude is operationalized by defining it as the attitudinal beliefs about the consequences of performing a particular behavior. Following instructions by Ajzen and Fishbein (1980), several measures do combine to get the overall score for attitude. In or-

der to receive a measure of "attitude toward the behavior of recycling household waste", a direct attitude measure, using seven-point Likert-scale questionnaire items (e.g., "Recycling is a beneficial activity (unimportant criterion – important criterion)") was assessed. Along with the direct measure, a combined measure is calculated. The combined measure is computed by adding the products of pairs of seven-point Likert-scale behavioral belief questionnaire items (e.g., "Recycling reduces landfill use and waste (strongly disagree – strongly agree)") and seven-point Likert-scale outcome evaluation questionnaire items (e.g., "I like to decrease landfill use and messy trash (extremely unimportant– extremely important)") (Questions 9a-c, 10a-g and 11a-g in Appendix, p.127f).The behavioral belief measures were drawn from previous research studies that inquired about the most salient beliefs and outcome evaluations about engaging in recycling.

Subjective norm is operationalized as an individual's normative beliefs concerning the influence of a particular referent (e.g., family, friends) over the participant performing a particular behavior. Following instructions by Ajzen and Fishbein (1980), a direct measure, using a seven-point Likert-scale subjective norm questionnaire item (e.g., "Most people who are important to me think I should recycle in the next week (strongly disagree – strongly agree)"), was assessed first. This was again contrasted to a combined measure, tabulated by summing seven-point Likert-scale normative belief questionnaire items (e.g., "How much do you agree with the statement that your neighbors think that you should recycle (strongly disagree – strongly agree)") multiplied by seven-point Likert-scale motivation to comply questionnaire items (e.g., "How likely it is that you would want to do what your neighbors thinks you should do? (extremely unlikely – extremely likely)"). The normative belief measures were drawn from previous research

studies that had asked respondents to list people who might have an influence over their decision to engage in curbside recycling (Questions 12 through 14 in Appendix, p. 129).

Perceived behavioral control is operationalized as the beliefs about the control an individual feels he or she has over performing a particular behavior. Following Ajzen's (1985) and Taylor and Todd's (1995) instructions, several measures combine to achieve an overall perceived behavioral control score. Direct perceived behavioral control measures were assessed using seven-point Likert-scale questionnaire items (e.g., "Whether or not I recycle is completely up to me (strongly disagree – strongly agree)"). A combined measure, computed by summing the products of pairs of seven-point Likert-scale control belief questionnaire items (e.g., "Recycling takes too much effort (strongly disagree – strongly agree)") and seven-point Likert-scale perceived control factor facilitation questionnaire items (e.g., "I don't like to participate in activities if they make my life more difficult (extremely unimportant– extremely important)") was again contrasted to the direct measure. Control beliefs and perceived facilitation beliefs were also drawn from previous research studies that asked for a list of items/ feelings that might facilitate or obstruct an engagement in recycling (Questions 9d, 10h-l and 11h-l in Appendix, p. 127f).

Response Variable

The response variable in this study is behavioral intention. This variable was chosen as the variable of interest, because the Theory of Planned Behavior states that behavioral intention directly predicts behavior (Ajzen 1985), unless intention precedes actual behavior with a huge time-lag. Therefore, it was of interest to find how independent variables relate to the reported behavioral intentions. Behavioral intention was defined as how likely or unlikely it is that a respondent would engage in a particular behavior, which

in this study means recycling. Similar to the other variables the instructions of Ajzen and Fishbein (1980) were followed, using seven-point Likert-scale questionnaire items (e.g., "During the next 30 days, how likely is it that you will take part in a city-sponsored recycling program (extremely unlikely – extremely likely)") to obtain a behavioral intention score (Questions 7 and 8 in Appendix, p. 127).

Reliability

Reliability refers to the degree to which a measure is free of variable measurement error. If we assume that the "true" score remains constant (e.g., that the person's "true" attitude has not changed), a perfectly reliable instrument will yield the same results on different occasions (Fishbein and Ajzen 1975). This will assure generalizability of the study's results.

The most appropriate method to measure reliability of a group of items that are hypothesized to measure separate aspects of the same concept is called internal consistency. The term refers to the consistency or cooperation that should exist between a subset of questions in measuring the same idea. The benefit of this technique is that it requires only a single test administration, which provides subsequently a unique estimate of reliability. The most popular of these estimates is given by Cronbach's alpha (Carmines and Zeller 1979).

In this study, items that were assumed to measure a concept (e.g., attitude) will be compared, using Cronbach's alpha. In total, tests will be conducted for the four values dimensions, attitudes, and the perceived behavioral control.

Validity

Validity, in general, refers to the degree to which an instrument measures the "true" score it was designed to measure (Fishbein and Ajzen 1975). For surveys, it refers to the items or scales in a questionnaire. Assessing the validity of a measuring instrument can take several forms. The most appropriate ones for the current study are discussed below.

Content Validity

This type of validity depends on the extent to which an empirical measurement reflects a specific domain of content (Carmines and Zeller 1979). As it is usually difficult to objectively measure an abstract theoretical concept, such as "value" precisely, content validity on average refers to the "mutual acceptance of the universe of content" (Cronbach and Meehl 1955) by a group of knowledgeable reviewers.

As far as the current study is concerned, a thorough review of the literature was conducted by the researcher to show a holistic picture of the concept that allows comparing and contrasting of the study's measures. Furthermore, academics in the College of Journalism and Communication and the College of Political Science at the University of Florida examined the literature and concepts, and agreed upon the fit of the measures with the studied concepts.

Convergent and Discriminant Validity

Convergent validity is achieved when an instrument that forms a valid measure of a construct correlates highly with another valid measure toward the same construct. Campbell and Fiske (1959) furthermore argued that an instrument should also have dis-

criminant validity. If the same method or instrument (e.g., the Likert procedure) is used to measure different variables (attitude toward different objects), different results should be obtained (Fishbein and Ajzen 1975).

For application to the Theory of Reasoned Action, Fishbein and Ajzen (1975) tested the convergent validity of the measures of its concepts (beliefs, attitudes, and intentions). They found that single self-report scales of attitude toward e.g., religiosity correlated highly with four traditional attitude scales (Guttman, Likert, Thurstone, and semantic differential scales). Schwartz (1992) found similar results in tests of the values measures. Davidson (1973) established empirical support for convergent and discriminant validity of intentional measures, using '*true-false*' and '*likely-unlikely*' scales to assess a variety of family planning concepts (e.g., intentions). Since this study's measures follow the specifications of both the Ajzen and Fishbein (1980) and the Schwartz (1992) models, it is thought that this study's measures establish validity properly.

Predictive Validity

Predictive validity refers to the ability of an instrument to estimate an important future behavior or event (Nunally 1978). Both the Theory of Reasoned Action and the Schwartz Values Theory apply models that are primarily designed to make predictions. Previous empirical research has established the studies' measures of e.g. behavioral intention, attitudes, and beliefs. Following the guidelines outlined in these theories strictly, the current study's measures are thought to predict the concepts equally well.

Construct Validity

Fundamentally, construct validity is concerned with the extent to which a particular measure relates to other measures consistent with theoretically derived hypotheses concerning the concept (or construct) that are being measured (Carmines and Zeller 1979). Thus, it focuses on the extent to which a measure performs in accordance with theoretical expectations of contributing to a single concept.

For the constructs in this study, taken from the Theory of Planned Behavior, the measures followed the exact specifications of Ajzen and Fishbein (1980), who have constructed a valid questionnaire to test the Theory of Planned Behavior. In reference to these concepts, validity of the study's measures is assumed.

The values construct measures follow research based on the Schwartz Values Model (Dietz and Stern 1994; Schwartz 1992; Young 1997), and can equally be considered valid. To assure unidimensionality of the four values dimensions (egoistic, biospheric, altruistic, and traditional) in this study, item loadings are established. If items do not load on the specific constructs or load on multiple constructs, they have to be assumed as weak predictors for the values dimension. They might make up a distinct, but related construct, and will be treated accordingly (e.g., taken out of further consideration for a particular values dimension or merged to form a unidimensional construct).

External Validity

External validity answers the question "to what populations, settings, treatment variables, and measurement variables an effect can be generalized" (Campbell and Stanley 1963). Because the sample in this study was drawn at random from a general

population in Gainesville, we can assume that there should not be a problem to generalize findings to the larger population of the sampling area (Gainesville).

Procedures

Measurement

A 30-item questionnaire was created and designed for telephone survey technology. A pilot-test was conducted to assess reliability and validity issues. Once these issues were found acceptable for the questionnaire, it will be administered to the sample.

The data will be collected in May 2002. Responses will be gathered by professional telephone callers under the supervision of the Florida Survey Research Center. The callers completed a one-to two-hour training session and have between two to four years of experience making calls. The random samples of residential telephone exchanges will be provided by Genesys Sampling Systems. A variety of efforts will be used to reduce bias due to nonresponse, including making weekend calls as supplements to weekday evening calls, performing multiple callbacks, and accommodating requests for interview appointments (Martinez & Scicchitano 1998).

This study implements a household survey that asks to speak to the person most familiar with the family's recycling. Once the respondents are willing to participate, the interviewer briefly discusses the purpose of the questionnaire of investigating attitudes toward the environment and recycling behavior. After the introduction, the interviewer explains the answer categories of the Likert scale and begins the interview. Initially, the interviewer will inform the respondents that this particular study has been approved by the Instructional Review Board at the University of Florida. The interviewer then reads

the respondents the approved informed consent and explains the rights of participation in the study. The interviewer also advises them again that any personal information that is given will be kept completely confidential, and that names and responses will be kept anonymous. The questionnaire is estimated to take about 15-18 minutes to complete.

Data Examination and Cleaning

Surveys will be visually inspected to look for obvious respondent errors. For example, if a whole section is unanswered, that particular survey is discarded. Before preliminary analysis, the data will be transformed to ensure proper analysis with SPSS. This transformation step includes recoding of values questions to eliminate negative numbers, and reverse-coding of negatively worded questions to assure consistency (Young 1997).

To further examine the data for errors frequency of all variables will be run. This procedure will identify any items that may be outside an acceptable range for a specific variable. Problems that surface through this procedure will be subsequently corrected. In a next step, the nature of the respondent answers will be examined as well. If a problem surfaces, the case will be identified and the problem corrected.

Statistical Analyses

The level of significance for the statistical tests for this study is .05. This equates to an acceptance of risk by this study that out of 100 samples, a true null hypothesis would be rejected five times (Polit and Hungler 1999). After aggregation the collected data will be analyzed in several ways, depending on the hypotheses and research question, they related to.

Data Aggregation

The items hypothesized to form the variables attitude, subjective norm, and perceived behavioral control will be subjected to a reliability analysis, and indices created for each respectively by averaging the means of the responses and combining the items measuring the three beliefs and three evaluations/ motivations into one weighted variable respectively. The weighted variables will be used in the correlation and regression analysis (Ringer-Lepre 2000).

A reliability analysis will also be conducted for the three values orientation to check, if the theoretical values differences would persist for this study. Then an index will be created for each values orientation, constructed as an average of the orientations. A fourth values orientation index, the rational (or self-driven) orientation, will be created as well from the difference of egoistic and altruistic/biospheric values. These weighted values variables will be used in the correlation and regression analyses.

Correlation Analysis

Hypotheses 4a through 4d will be tested using bivariate correlation analysis. The correlation table will provide the significance of relationship between each of the four values orientations and attitude, subjective norm and perceived behavioral control.

Regression Analyses

The remaining hypotheses will be tested using simple or multiple linear regression. Hypotheses 1 through 3 are using multiple regression to test the original Theory of Planned Behavior. This means that the attitude, subjective norm, and perceived behavioral control factors will be regressed against the two aggregated recycling intention fac-

tors (plan to recycle, do not plan to recycle). Hypotheses 5a through 5c uses simple linear regression, testing the partial effect of one of the determinants of intention (attitude, subjective norm, or perceived behavioral control) without the addition of their respective values orientation and with their interaction of this value orientation, both multiplicative (e.g., $V_{rat} \times A$) and additive (e.g., $V_{rat} + A$). The three resulting goodness-of-fit values (R^2) will be compared to observe, if the original R^2 value (that without addition of a values term) has significantly improved by either method. The results of those three regressions will then be used in Hypothesis 6, comparing the original Theory of Planned Behavior regression equation to the values-enhanced regression equation, applying the most appropriate interactive term for each variable.

Assumptions of Multiple Regression Tests

Since multiple and simple linear regression are the primary methods for testing the hypotheses (Agresti 1997; Norusis 1994), attention needs to be paid to its assumptions. The assumptions underlying multiple regression concern both the dependent and independent variables and the relationship between those. Unlike many other statistical tests, the analysis of assumption violation must be performed after the estimation of the regression model. According to Hair et al. (1987), "the basic issue is whether, in the course of calculating the regression coefficients and predicting the dependent variable, the assumptions of regression analysis have been met (p. 172)." The major assumptions are (Hair et al. 1987):

1. Linearity of the phenomenon: There is an assumed linear relationship between the group of independent variables as well as between each independent variable and the dependent variable. An analysis of partial regression plots between each independent variable and the dependent variable was suggested by Hair et al. (1987) to assess this

assumption. A curvilinear pattern of residuals would indicate a non-linear relationship.

2. Constant variance of the error term: This assumption refers to the concept of homoscedasticity (equal variance). Hair et al. (1987) recommended plotting the studentized residuals against the predicted dependent variable values and comparing them to a null plot (a random plot of points).

3. Independence of error terms: Regression analysis assumes independence of the predicted value. Predictions are not sequenced by other variables .Plots of residuals against possible sequencing variables are useful to identify non-independence.

4. Normality of the error term distribution: Normal probability plots, comparing standardized residuals to a normal distribution (straight line), are a useful method for identifying this condition (Hair et al. 1987).

This study will examine studentized residuals, outliers, influential observations, and multicollinearity to test for assumption violations as outlined by Hair et al. (1987). Partial regression plots will be used to examine the linearity of relationships. Cases that are identified as violating these assumptions will be deleted from further specification.

To identify outliers, visual inspection of partial regression plots as well as individual leverage values will be used. The latter indicate the distance between a single case and the center of all observations. According to Neter et al. (1990), values greater than 2p/n were scanned, whereby p = the number of regression parameters in the function including the intercept term, and n = sample size. The typical regression function for this study includes the intercept and the variables attitude, subjective norm, and perceived behavioral control for a total of four regression parameters with a sample of 400.

As a second method to detect outliers, studentized deleted residuals will be used. Following Neter et al. (1990), absolute values of the studentized deleted residuals will be compared to a t-distribution with n-p-1 degrees of freedom.

The Variance Inflation Factor (VIF) will be used to discover multicollinearity effects. Neter et al. (1990) suggest that multicollinearity between the independent variables exists, if a VIF value in excess of 10 for any of the independent variables is present. Hair et al. (1987) suggest a process that this study followed. First, all condition indices above a threshold value of 15, a conservative value (Hair et al. 1987), will be identified. Among condition indices exceeding 15, variables with variance proportion above 90% will be identified. A .90 or higher between two or more coefficients will indicate multicollinearity.

For each regression, the Enter variable function will be used. Consistent with the hypotheses of this study, this approach enters all variables simultaneously. After the data are adjusted for violations of assumptions a second analysis will be conducted. In all cases, the first elimination of outliers produces results that will be judged to adequately meet the assumptions of multiple regression.

CHAPTER 4
RESULTS

This chapter consists of three parts. First, a discussion of the descriptive statistics about the study sample and assumptions of the regression method. Next, the analysis of the original Theory of Planned Behavior, and an examination of the value-added model. Finally, the results of the respective hypothesis tests and answers to the research questions are presented. The key method used for the statistical tests was multiple linear regression.

Preliminary Analyses

A discussion of the demographic statistics, the results of the data examinations, and the results of the tests for violations of the regression model assumptions follows.

Study Participants

Four hundred residents in the Gainesville, Florida area were surveyed during the last two weeks of May 2002 by telephone. The participants ranged in age from 18 to 89 with a mean age of 40.9 years (SD=18.6). There were slightly more women in the sample with approximately 62 percent of the respondents being female (n = 247). Most respondents (96%) had a high school diploma or more. There was a statistically significant difference (t=3.16, p=.002) in educational levels between recyclers and nonrecyclers. Both segments lived an average of 13 years in the Gainesville area with recyclers slightly longer (+2 years). The household income demographics showed a propensity to recycle that was slightly more pronounced among more affluent people. While 62% of house-

holds with an income above $35,000 tended to recycle, only 49% of households below $35,000 did so. There was no statistical difference between recyclers and nonrecyclers as far as their political orientations were concerned. While recyclers tended to lean slightly more liberal (30%), the nonrecycler segment was concentrated in the moderate category (40%). Details on the demographic characteristics are summarized in Table 4-1.

Table 4-1. Demographic characteristics of recyclers and nonrecyclers

Characteristic	Recyclers *(N = 365)*	Nonrecyclers *(N = 35)*	t	Significance	Total *(N = 400)*
Age (years)			3.24	.001	
Range	18-89	19-81			18-89
Mean (SD)	41.1 (18.5)	32.3 (16.6)			40.9 (18.6)
Education [n (%)]			3.16	.002	
College+	311 (85)	26 (74)			337 (84)
No college	50 (14)	9 (26)			59 (15)
Family income [n (%)]			0.05	.964	
> $35,000	225 (62)	17 (49)			242 (61)
< $35,000	108 (30)	16 (46)			124 (31)
Political orientation [n (%)]			1.51	.146	
Conservative	88 (24)	6 (17)			94 (23)
Moderate	134 (37)	14 (40)			148 (37)
Liberal	109 (30)	8 (23)			118 (29)
Residency (years)			1.59	.114	
Range	0-75	0-52			0-75
Mean (SD)	15.2 (15.3)	12.4 (12.8)			14.9 (15.1)

Data Examination Results

Surveys were visually inspected to control for obvious respondent errors. Incomplete surveys and surveys that seemed to be answered the same way throughout the survey were discarded. Multiple samples were ordered by the Florida Survey Research Institute to arrive at the contracted number of 400 respondents. As a result none of the 400 surveys had to be discarded due to survey errors. Surveys were then given case identification numbers for further analysis. The dataset arrived in an ASCII format. The data were

first entered into Excel and then visually inspected for data entry error. If an error was found on a specific row, the survey was retrieved by case number and the record was corrected. The entire file was translated to SPSS for preliminary analysis. In addition, negatively worded questions (Q11.8-11.12, Q12.8-12.12) were reverse-coded for consistency.

After the data entry, a preliminary inspection of the data was conducted to uncover potential confounding effects in the sample. Frequencies of all variables were run to further examine the data for error. The data were inspected to determine if items fell outside the acceptable range for a particular variable. In a next step, the nature of the respondent answers was examined. Cases were checked for "Don't know" and "Refused" answers by sorting the cases in an ascending fashion from the lowest to highest value. Cases with "Don't know" and "Refused" answers were considered missing variables and discarded.

Similarly, all weighted variables, such as the attitude belief and outcome evaluation total, were checked for missing values. Cases with data of that nature were evaluated as being missing and listwise deletion was used to eliminate them. Out of a total of 400 surveys, 87, (22%) were discarded because they had missing values in one or more of the model variables. A total of 313 cases were retained for further analysis.

Regression Model Assumptions

Regression analyses involve a series of assumptions about the relationships of the variables being measured to each other. These assumptions again are as follows:

1. Linearity of the phenomenon
2. Constant variance of the error term
3. Independence of the error term
4. Normality of the error term distribution

Violation of these assumptions can lead to serious problems in interpreting the results of the study. To test for assumption one and two, standardized residuals were plotted against the predicted individual independent variables. The scatterplots showed a random distribution void of observable pattern. As for assumption three, although data were not collected and recorded sequentially, it is plausible that 'time' may have influenced the residuals. The plot of standardized residuals against the sequencing variable showed no discernible pattern. Finally, to test for normality (assumption four), a histogram of residuals was constructed and superimposed with a normal distribution curve. The distribution of residuals appeared to be approximately normal.

Multicollinearity did not surface as a problem in the analyses of this study. This was in part due to the fact that empirically tested variables and variable relationships of tried theories were used. Both the Theory of Planned Behavior and the Schwartz Values Model have been tested extensively by subsequent research. The variables behaved in the detected fashion in this study as well.

Analysis of the Theory of Planned Behavior

This section discusses the results of the first three hypotheses, testing the Theory of Planned Behavior as an explanation of recycling intention. The first hypothesis proposed that belief and outcome variables would predict attitude, subjective norms and perceived behavioral control. The second hypothesis predicted that attitude, subjective norms, and perceived behavioral control would explain recycling intentions. The third hypothesis suggested that attitude and perceived behavioral control would be the most significant influence factors on recycling intentions.

Variable Preparation

Before testing the hypotheses, it was necessary to recode the attitude variable and create an index. Three items on the questionnaire were designed to measure respondents' attitude toward recycling. Each question was worded "Participation in recycling is" followed by a different response scale for each question.

The seven-point scales measured the respondents' evaluation of how wise/foolish, important/unimportant, and beneficial/harmful they perceived recycling. A reliability analysis yielded an alpha of .76 for the three items. The attitude index was created by averaging the means of the responses of the three items.

As far as the variables subjective norm and perceived behavioral control were concerned, there was only one item determining a general measure of each variable. The measure for subjective norm was worded: "Please tell me much you agree with the statement that most people who are important to you think that you should recycle" with answers ranging from strongly disagree (1) to strongly agree (7). The measure for perceived behavioral control was worded: "Whether or not I recycle is completely up to me" with an identical answer distribution. Since those two variables were composed of single-item measures, it was unnecessary to create an index for use in the regression model. All three variables were subsequently recoded to change their one to seven scales into bipolar -3 to +3 scales to be consistent with the following predictor variables.

New weighted variables for the three explanatory variables in the model were required. The items measuring behavioral beliefs and outcome evaluations, normative beliefs and motivation to comply and control beliefs and perceived facilitation were com-

bined into one weighted variable each. These three weighted variables were subsequently used in the regression model.

To accomplish this, the items measuring behavioral beliefs, normative beliefs, control beliefs, outcome evaluation, motivation to comply, and perceived facilitation were recoded to change their one to seven scales into bipolar -3 to +3 scales. Then, each of the seven items measuring behavioral beliefs was multiplied with its matched item measuring outcome evaluation. For example, the two items "Recycling reduces landfill use and waste" (behavioral beliefs) and "I like to decrease landfill use and messy trash" (outcome evaluation) were a matched pair and their product formed a weighted variable.

Similarly each of the five items measuring normative belief was multiplied with its matched item measuring motivation to comply, as were the five items measuring control belief with their matched item measuring perceived facilitation.

Regression Study

Hypotheses one through three used linear regression to analyze the Theory of Planned Behavior. Hypothesis one stated that the explanatory variables behavioral beliefs and outcome evaluations will predict attitudes toward recycling, normative beliefs and motivations to comply will predict subjective norms about recycling, and control beliefs and perceived facilitation will predict perceived control about intentions to engage in recycling. The regression analysis showed a significant and positive correlation between the weighted variables representing behavioral beliefs and outcome evaluations and the attitude index ($r=.381$, $p<.001$). The regression analysis also showed a significant and positive correlation between the weighted variables representing normative beliefs and motivation to comply and the general subjective norm variable ($r=.230$, $p<.001$). Finally,

the regression showed a significant and positive correlation between the weighted variables representing control beliefs and perceived facilitation and the general variable measuring perceived behavioral control ($r=.195$, $p<.05$). Consequently, it was concluded that these weighted variables were significant predictors of attitude, subjective norm, and perceived behavioral control.

Hypotheses two and three maintained that attitudes, subjective norms, and perceived behavioral control would predict behavioral intention to engage in recycling, and that attitudes and perceived control would be the major predictors of intention to engage in recycling. A regression analysis revealed a significant and positive correlation between attitude and behavioral intention ($r=.208$, $p<.001$). The correlation between subjective norm and behavioral intention was positive, but not significant ($r=.078$, $p<.10$), as was the correlation between perceived control and behavioral intention ($r=.043$, $p=.25$).

The three variables then were entered into the model using stepwise regression analysis (Table 4-2). The results showed that only attitude was a significant predictor of behavioral intention (Table 4-3). As residents' attitudes toward recycling increase, so do residents' intentions to engage in recycling activities.

Table 4-2. Stepwise model

Measure	Step	r
Attitude	1	.208
Subjective Norm	2	.078
Perceived Behavioral Control	3	.043

Table 4-3. Intention to recycle household waste

Measure	St. Beta	t	Significance
Attitude	.208	3.39	.001
Subjective Norm	.078	1.26	.210
Perceived Behavioral Control	.047	0.77	.444

From the results of these hypotheses tests, a path model showing the application of the Theory of Planned Behavior concerning recycling was developed (Figure 4-1).

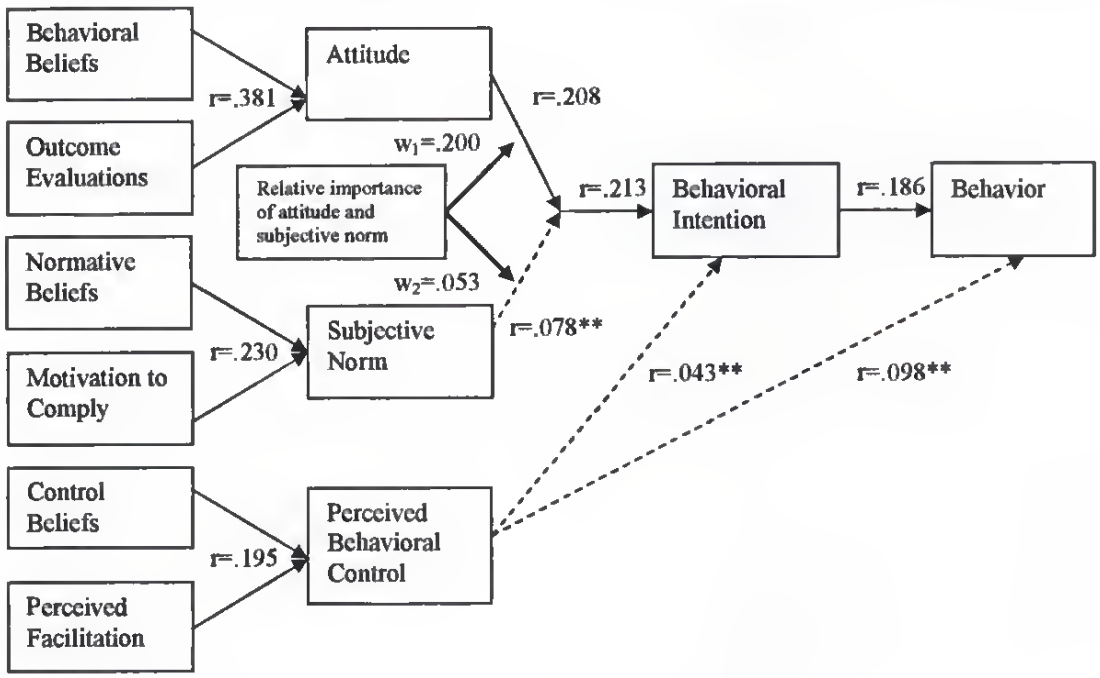

Figure 4-1. Path model for the Theory of Planned Behavior.
** indicates non-significant path

Analysis of the Proposed Values-Enhanced Model

This section discusses the results of the final eight hypotheses tests. These hypotheses examined the roles values orientations play in explaining recycling intention, and if the likelihood of recycling intentions can be explained better if one includes values to the belief-behavior model of Ajzen and Fishbein.

Before testing the hypotheses, the four values variables were recoded and an index created for each of them. Four items on the questionnaire were designed to measure respondents' egocentric values orientation. Four items were designed to measure respondents' altruistic values orientation. Three items were designed to measure respondents'

biospheric values orientation. Five items were designed to measure respondents' traditional values orientation. Each question was worded "How important are the following principles in your life" followed by a response scale from "extremely unimportant" to "extremely important" for each question.

A reliability analysis was conducted for each values dimension to see how well a question set measured each construct. The analyses yielded the following: an alpha of .67 for the four egoistic values items; an alpha of .87 for the four altruistic values items; an alpha of .81 for the three biospheric values items; an alpha of .84 for the combined altruistic/biospheric values items; and an alpha of .66 for the five traditional values items. The constructed rational values orientation – computed as the difference between egoistic and altruistic values – was checked by examining the correlation between the questions pertaining to those values. The analysis yielded an alpha of .63 on the eight items. Four values indices were created by averaging the means of the responses of the items.

Correlation Study

Hypotheses four (a) through four (d), aimed to corroborate the basic structure of the effects of the four values dimensions (egoistic, altruistic, traditional, rational) on the three determinants of behavioral intention respectively via correlational analysis.

Hypothesis four (a) stated that the egoistic value orientation would be positively related to the control component and negatively related to the attitudinal and normative components. The Pearson correlation (Table 4-4) showed that the egoistic values dimension correlated significantly with perceived behavioral control ($r=.207$, $df=313$, $p<.001$). This value was not significantly correlated with any other component.

Hypothesis four (b) affirmed a positive relationship between the altruistic/biospheric value orientation and the attitudinal component and a negative relationship between this value and the control and normative components. The altruistic/biospheric values dimension correlated significantly but negatively with attitude ($r=-.227$, $df=313$, $p<.001$) as well as with subjective norm ($r=-.127$, $df=313$, $p<.01$). It did not correlate significantly with perceived behavioral control ($r=.047$, $df=313$, $p=.45$).

Hypothesis four (c) maintained that the traditional value orientation is positively related to the normative component and not significantly related to the attitudinal and control components. While the traditional values dimension did indeed correlate significantly with subjective norm, it correlated negatively ($r=-.175$, $df=313$, $p<.001$). Furthermore, it did not significantly correlate with either attitude ($r=-.092$, $df=313$, $p=.14$), or perceived behavioral control ($r=.088$, $df=313$, $p=.16$).

Finally, hypothesis four (d) stated that the rational value orientation (the resultant value of the difference of egoistic value orientations and altruistic/biospheric value orientations) is positively related to the attitudinal component and negatively related to the normative and control components. The correlation analyses confirmed this hypothesis in part (Table 4-4). The rational values dimension was positively correlated and statistically significant with attitude ($r=.172$, $df=313$, $p<.001$), but not significantly correlated to subjective norm ($r=.019$, $df=313$, $p=.76$). On the other hand, the findings showed a weak positive correlation with perceived behavioral control ($r=.148$, $df=313$, $p<.01$).

Table 4-4. Pearson correlation coefficients between values and model components

	Egoistic Values	Altruistic Values	Traditional Values	Rational Values (V_e-V_a)
Attitude	.037	-.227**	-.092	.172**
Subjective Norm	-.090	-.127*	-.175**	.019
Perceived Behav. Control	.207**	.047	.088	.148*

Note: * = p<.01, ** = p<.001

Regression Study

Based on the strength of the relationship of individual values dimensions and individual determinants of behavioral intention, hypotheses five (a) through five (c), tested the effect of the respective value on the significance of the respective determinant on the response variable intention. In other words, if a particular value is intricately connected to a particular determinant, then the goodness-of-fit indicator (R^2) of this determinant toward the response variable should increase significantly, if an interaction term is used rather than the determinant variable alone. These assumptions were analyzed using simple linear regression.

Hypothesis five (a) asserted that the inclusion of the rational value orientation to the attitude component would make a significant contribution in the prediction capability of attitude for recycling intention. To conduct the analysis, scores on behavioral intention were first regressed onto scores for attitude and then onto both the multiplicative interaction term of attitude with rational values (attitude x rational values orientation) and the additive interaction term of attitude with rational values (attitude + rational values orientation). Results showed that when entered alone, the main effect accounted for a significant proportion of the variance in behavioral intention, R=.208, $F(1, 312) = 11.49$, $p<.001$. When the multiplicative interaction term was entered into the equation, it did not

account for a significant increase in the proportion of explained variance, R^2 change = .009, F(2, 311) = 0.06, p=.80. However, the additive interaction term did account for a small but statistically insignificant increase, R^2 change = .013, F(2, 311) = 3.39, p<.06.

To account for the actual significance in increase in R^2, the two regression models were compared using the R^2 comparison technique for complete and reduced models as introduced by Agresti (1997, p. 409-410). In short, "since the complete model has *k* explanatory variables, it has *n-(k+1)* degrees of freedom. Similarly, the reduced model, which contains *g* explanatory variables, has *n-(g+1)* degrees of freedom. The addition of the extra *(k-g)* terms in the complete model reduces the error degree of freedom by *(k-g)*. A relatively large reduction in error yields a large *F* test statistic and small *P*-value" (Agresti, 1997). In other words, the change in R^2 can be considered significant. The comparison technique revealed a significant change in explanatory power at the 95% confidence level, F(1, 312) = 9.54, p<.05.

Hypothesis five (b) contended that the inclusion of the traditional value orientation to subjective norms would make a significant contribution in the prediction capability of subjective norms for recycling intention. To conduct the analysis, scores on behavioral intention were first regressed onto scores for subjective norm, and then onto both the multiplicative interaction term of subjective norm with traditional values (subjective norm x traditional values orientation) and the additive interaction term of subjective norm with traditional values (subjective norm + traditional values orientation). Results showed that when entered alone, the main effect by itself did not account for a significant proportion of the variance in behavioral intention, R=.078, F(1, 312) = 1.58, p=.21. When the multiplicative interaction term was entered into the equation, there was no increase in the

proportion of explained variance, R^2 change = .000, F(2, 311) = 0.19, p=.89. The same occurred when entering the additive interaction term, which also failed to account for a significant increase, R^2 change = .000, F(2, 311) = 0.19, p=.88. As a result, it was not necessary to perform the model comparison check.

Finally, hypothesis five (c) stated that the inclusion of the egoistic value orientation to perceived behavioral control would make a significant contribution in the prediction capability of perceived behavioral control for recycling intention. Again, to conduct the analysis, scores on behavioral intention were first regressed onto scores for perceived behavioral control, and then onto both the multiplicative interaction term of perceived behavioral control with egoistic values (perceived behavioral control x egoistic values orientation) and the additive interaction term of perceived behavioral control with egoistic values (perceived behavioral control + egoistic values orientation). Results showed that when entered alone, the main effect did not explain a significant proportion of the variance in behavioral intention, R=.043, F(1, 312) = 0.60, p=.44. When the multiplicative interaction term was entered into the equation, it did not lead to a significant increase in the proportion of explained variance, R^2 change = .009, F(2, 311) = 1.17, p=.31. As a precaution, the model comparison test was conducted to see if this minimal increase had significance for the model. No significance increase was detected, F(1, 312) = 1.25, p>.05. The additive interaction term did also not account for a significant increase, R^2 change = .001, F(2, 311) = 0.29, p=.59.

Table 4-5 summarizes the results for the regression model. As expected from the previous analysis of the Theory of Planned Behavior, the main effect for attitude was significant, but those for subjective norm and perceived behavioral control were not. The

predicted interactions were only marginally significant. For example, only for one of the determinants (attitude) did an interaction improve the proportion of the explained variance a little. The findings do not support an assumption that due to significant correlations between certain values orientations and parameters, an additive or multiplicative interaction term significantly improves the model.

Table 4-5. Regression of behavioral intention on individual model components and interactions with respective values dimensions

Variable	b	β	t	Significance
Attitude (A)	.281	.208	3.39	.001
$A \times V_{rat}(V_e\text{-}V_a)$	.002	.016	0.25	.802
$A + V_{rat}(V_e\text{-}V_a)$	.311	.215	1.84	.067
Subjective Norm (SN)	.004	.078	1.26	.210
$SN \times V_{tra}$	-.002	-.009	-0.43	.891
$SN + V_{tra}$	-.001	-.009	-0.43	.891
Perceived Behav. Control (PBC)	.006	.047	0.77	.444
$PBC \times V_{alt}$	.002	.045	1.08	.476
$PBC + V_{alt}$	-.002	-.034	-0.54	.589

Based on the hypothesized functioning of these individual interactions between specific values and specific model parameters, hypothesis six was formulated. It stated that the inclusion of values as an intimate portion of the parameters determining intention would ultimately improve the predictability of the three model determinants in the Theory of Planned Behavior to explain recycling intentions.

Again, the original regression model of the main effects of the three determinants (attitude, subjective norm, perceived behavioral control) was compared to a model where the determinants were in an interactive relationship with a close correlating value. The implementation of any interactive term models seemed academic at this time, since the individual regressions did not reveal any significant improvement of any of the three

variables. Results had shown that when entered alone, the main effect accounted for a significant proportion of the variance in behavioral intention, R=.219, F(3, 310) = 4.23, p<.005. As expected, neither the multiplicative interaction terms, R=.051, F(6, 307) = 0.26, p=.86, nor the additive interaction terms, R=.128, F(6, 307) = 1.41, p=.24, accounted for a more significant proportion of the variance in behavioral intention.

From the results of these hypotheses tests, a path model showing the application of the Values-Enhanced Model concerning recycling was developed (Figure 4-2). As the paths from the determinants to behavioral intention indicated, the predictive power of the variables did not increase significantly over their original values (Figure 4-1).

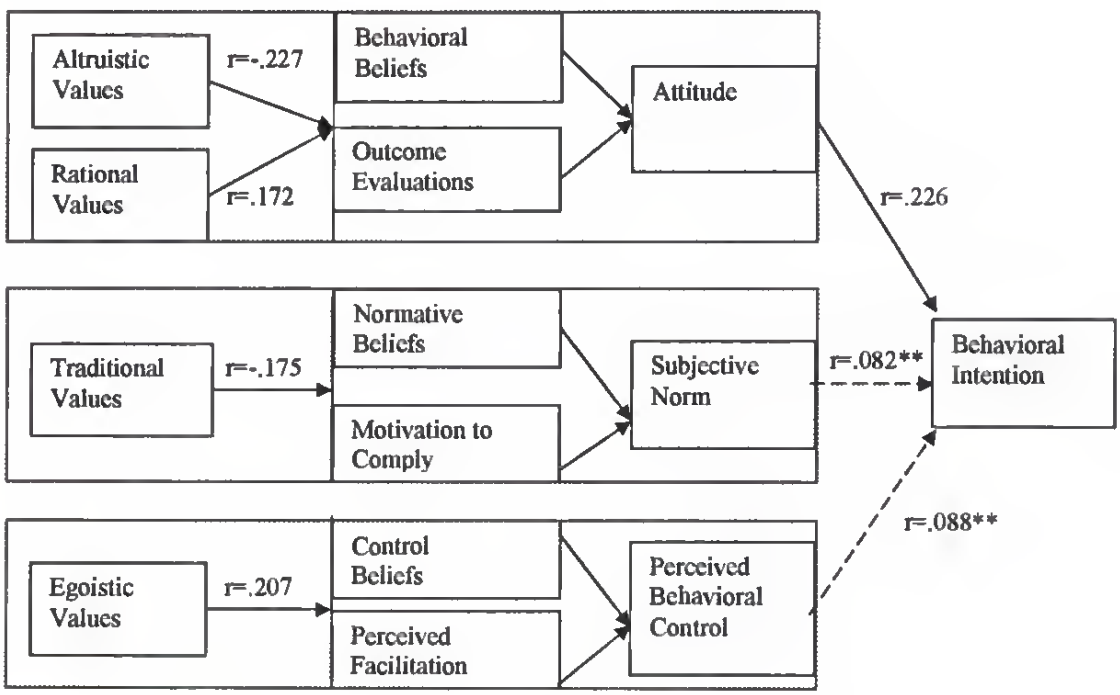

Figure 4-2. Path Model for the Values-Enhanced Model
** indicates non-significant path

These findings did not support the original assumption that the inclusions of values within the attitude, norm, and control elements of the Theory of Planned Behavior

would explain a significant portion of the predictive power of these. However, since individual values orientations seemed to have a significant relationship with individual parameters in the original model (Table 4-4), it raises the question how values affect the model.

Summary of the Hypotheses Tests

Hypothesis one theorized that the explanatory variables of behavioral beliefs, outcome evaluations, normative beliefs, motivations to comply, control beliefs, and perceived facilitation would predict attitudes toward, subjective norms about, and perceived control about intentions to engage in recycling. This hypothesis was supported. Linear regression tests exhibited a positive, significant correlation between the explanatory variables and the respective predictor variable in the model of the Theory of Planned Behavior.

Hypothesis two posited that attitudes, subjective norms, and perceived behavioral control would predict behavioral intention to engage in recycling. This hypothesis was not supported. Linear regression revealed a significant positive relationship between attitude and behavioral intention, supporting the prediction. However, the relationship of subjective norm and perceived behavioral control with behavioral intention, although positive, was not significant.

Hypothesis three stated that attitudes and perceived control would be major predictors of intention to engage in recycling. This hypothesis was partially supported. As mentioned in the discussion above, it was observed that attitude was the most significant predictor in the model. However, perceived behavioral control was not a significant predictor for behavioral intention.

Hypothesis four (a) speculated that egoistic value orientations would be positively related to the control component and negatively related to the normative and attitudinal components. This hypothesis was partially supported. While egoistic value orientations were positively correlated to perceived behavioral control, this value was not significantly correlated with either subjective norm or attitude.

Hypothesis four (b) posited that altruistic/biospheric value orientations would be positively related to the attitudinal component and negatively related to the control and normative components. This hypothesis was not supported. The altruistic/biospheric value orientations correlated significantly but negative with both attitude and subjective norm. The correlation with perceived behavioral control was not significant.

Hypothesis four (c) asserted that traditional value orientations would be positively related to the normative component and not significantly related to the attitudinal and control components. This hypothesis was not supported. The traditional values dimension did correlate significantly with subjective norm, but the correlation was negative. Furthermore, it did not significantly correlate with either attitude or perceived behavioral control.

Hypothesis four (d) stated that rational value orientations would be positively related to the attitudinal component and negatively related to the normative and control components. This hypothesis was partially supported. The rational values orientations were positive correlated to attitude, but also positive correlated to perceived behavioral control. The latter correlation was less significant. Moreover, there was no significant correlation to subjective norm.

Hypothesis five (a) posited that the inclusion of rational value orientations to attitudes would make a significant contribution in the prediction capability of attitude for recycling intention. This hypothesis found marginally support. Linear regression tests, probing for interaction, showed that when the additive interaction term between attitude and rational values orientations was entered into the equation, it accounted for a very weak increase in the proportion of explained variance of behavioral intention to recycle.

Hypothesis five (b) asserted that the inclusion of traditional value orientations to subjective norms would make a significant contribution in the prediction capability of subjective norms for recycling intention. This hypothesis was not supported. Linear regression tests, probing for interaction, showed that when the multiplicative or additive interaction term between subjective norms and traditional values orientations was entered into the equation, it did not account for a significant increase in the proportion of explained variance of behavioral intention to recycle.

Hypothesis five (c) posited that the inclusion of egoistic value orientations to perceived behavioral control would make a significant contribution in the prediction capability of perceived behavioral control for recycling intention. This hypothesis was not supported. Linear regression tests, probing for interaction, showed that when the multiplicative or additive interaction term between perceived behavioral control and egoistic values orientations was entered into the equation, it did not account for a significant increase in the proportion of explained variance of behavioral intention to recycle.

Hypothesis six speculated that the inclusion of values would increase the predictability of the attitudinal, normative and control determinants to explain recycling intentions in the Theory of Planned Behavior model. This hypothesis was not supported. Lin-

ear regression revealed that neither the multiplicative interaction terms nor the additive interaction terms did reveal an increase in the proportion of explained variance of behavioral intention to recycle.

A summary chart of the various hypotheses and their key results is provided in Table 4-6 below.

Table 4.6. Summary of the hypotheses

Hypothesis	Main Assumption	Main Findings
1	$\Sigma\, ab_i e_i$ predict A, $\Sigma\, nb_j mc_j$ predict SN, $\Sigma\, cb_k pf_k$ predict PBC	Supported
2	A, SN and PBC predict BI	Only A had significant influence
3	A and PBC are significant predictor of BI	Only A was significant, PBC was not
4a	V_{ego} relates positive to PBC V_{ego} relates negative to A, SN	V_{ego} was positively related to A V_{ego} was unrelated to SN, PBC
4b	V_{alt} relates positive to A V_{alt} relates negative to SN, PBC	V_{alt} was negatively related to A, PBC V_{alt} was not related to SN
4c	V_{tra} relates positive to SN V_{tra} does not relate to A, PBC	V_{tra} was negatively related to SN V_{tra} was not related to A, PBC
4d	V_{rat} relates positive to A V_{rat} relates negative to SN, PBC	V_{rat} was positively related to A, PBC V_{rat} was not related to SN
5a	V_{rat} and A together improve predictability of A on BI	A's predictability was marginally improved
5b	V_{tra} and SN together improve predictability of SN on BI	Not supported
5c	V_{ego} and PBC together improve predictability of PBC on BI	Not supported
6	Including values to A, SN and PBC improves predictability of parameters on BI	Not supported

Exploratory Post-Hoc Analyses

To speculate on the effect of values on recycling behavior, two alternative scenarios are briefly described. One concerns the effect of attitude, subjective norm and per-

ceived behavioral control on actual behavior, the other concerns the belief and outcome variable pairs in their function as dependent variables.

If one looks at the effect of attitude, subjective norm and perceived behavioral control on actual behavior, one can hypothesize again that interactive terms that match up these parameters with the above mentioned values orientations might deliver a significant increase in explaining recycling behavior.

To illustrate the hypothesized improvements, behavior was regressed on the model parameters in their original state and in a multiplicative and additive interaction relationship with the values orientations discussed in the hypothesis. The additive interaction appeared to show some improvements of the explanatory power of the model. Results showed that when entered alone, the main effects did explain a significant proportion of the variance in behavior, $R=.228$, $R^2=.052$, $F(3, 310) = 4.19$, $p<.007$.

When the additive interaction terms were entered into the equation, it lead to a significant increase in the proportion of explained variance, $R=.243$, R^2 change=.059, $F(6, 307) = 4.82$, $p<.003$. These findings were supported by Table 4-7, which shows the effect change for the individual parameters. However, this was not the case for subjective norm.

Table 4-7. Regression of behavior on original and interactive model components

Measure	St. Beta	t	Significance
A	.109	1.69	.092
SN	.161	2.49	.013
PBC	-.093	-1.44	.150
$A + V_{rat}$	.115	1.76	.080
$SN + V_{tra}$	.129	1.99	.048
$PBC + V_{ego}$	-.177	-2.68	.008

Simultaneously, it was speculated that the strongest effects of values would occur on the three belief and evaluation variables. Therefore, it was probed whether a specific values dimension would have a significant relationship to any of the determinants of the attitudinal, normative and control components. The Pearson correlations (Table 4-8) showed that all values dimension correlated significantly with one or more determinants. The table also shows that the values are not necessarily solely correlated with the belief component of the pair.

Table 4-8. Pearson correlation coefficients between values and model determinants

	Egoistic Values	Altruistic Values	Traditional Values	Rational Values (V_e-V_a)
Attitudinal Beliefs	.094	.389**	.218**	-.162**
Outcome Evaluations	.191**	.489**	.263**	-.142*
Normative Beliefs	.147*	.240**	.108	-.024
Motivation to Comply	.241**	.162**	.216**	.105
Control Beliefs	-.010	.193**	.036	-.129*
Perceived Facilitation	-.251**	.053	-.081	-.247**

Note: * = $p<.01$, ** = $p<.001$

These findings reemphasize the findings and conclusions from Bagozzi and Dabholkar (1994), who asserted that "recycling-related beliefs are *concrete judgments* about the consequences (positive or negative) of recycling and tend to focus more on *means or outcomes*, while recycling goals, in contrast, are *abstract motives* for recycling (by definition positive) and refer to *ends*."

Summary of the Research Questions

The first research question asked what role values orientations plays in explaining recycling intention. This question was derived from the idea that personal, social or traditional values can directly and indirectly influence behavioral intentions. In so doing, val-

ues related to a specific behavior could become the origin of beliefs regarding the intention. The close correlation that specific values dimensions display with specific predictors of behavioral intention (e.g., rational values and attitude) pointed toward a justification of this idea, helping to explain the origin of beliefs in the model. Moreover, it appears that certain values, explaining a portion of the overall personality of an individual, are as focused as the beliefs that derive from them. Therefore, it seems necessary to apply as careful an operationalization of the salient values dimensions as is necessary for the belief parameters.

The second research question asked if attitudes, social norms, and perceived control dominance in reference to recycling intentions could be traced back to their specific underlying values orientations. There is evidence to answer this question in the affirmative. Recalling the study by Bagozzi and Dabholkar (1994), intentions to recycle, or recycling goals, were considered to be abstract motives for recycling (by definition positive), referring to ends (e.g., provide for future generations). Recycling goals, then, are more conative and may even be deontological moral values that motivate or compel one to act. Many recycling goals, particularly higher-order ones, do not arise from decision making but are a priori virtues. This would also mean that the determinants of recycling intentions (goals) do likewise evolve from said "a priori virtues." Following this thought, an "a priori virtue," or specific values dimension, may affect a specific predictor of recycling intention, being connected to it in a close manner. However, this study did not find any support for the actual involvement of values in the strength of the predictor variables, attitude, subjective norm, and perceived behavioral control, to explain recycling intentions. The previous excursion might point to some fruitful direction for a values influence on

actual behavior. However, the results of this study appear to deny a direct effect of values on determining which of the three predictors dominates in reference to recycling intentions.

The third research question asked if the likelihood of recycling intentions would be explained better if we include values to the belief-behavior model. This question cannot be answered positively or negatively by reflecting only on the hypotheses raised above. The current findings suggest that there is no improvement of explanation by including values to the belief-behavior model. On the other hand, numerous studies have demonstrated an effect of proenvironmental values. While it does not seem conclusive at this point that values function in a strict hierarchical relationship with the parameters of the Theory of Planned Behavior, it is plausible that they have an intervening character or determine intuitive acting outside the realm of rational deliberation.

CHAPTER 5
DISCUSSION

This chapter will reflect on the research questions, hypotheses and findings of the current study. The original idea of this study was to test and confirm the Theory of Planned Behavior (Ajzen 1985) in its application toward household recycling. The study attempted to examine whether the inclusion of environment- or recycling-oriented values dimensions in the Theory of Planned Behavior model would strengthen the predictability of recycling intention of individuals. The chapter is organized in the following five sections: a discussion of the applicability of the Theory of Planned Behavior to predict recycling interest; a discussion of the effects of the inclusion of specific values dimensions within the determinants of behavioral intention; a discussion of the relevance of the findings for public entities in charge of community recycling in designing PSA or advocacy campaigns that aim to affect behavioral change; a discussion of the study's limitations; and finally suggestions for future research.

Applicability of the Theory of Planned Behavior to Predict Recycling Interest

Overview of the Hypotheses

The first three hypotheses predicted that recycling intention could be explained with the variables proposed in the Theory of Planned Behavior. Several empirical studies have tested the Theory of Planned Behavior (Ajzen 1985) and found support for the predictive ability of this model for non-volitional behaviors. To review, the theory hypothe-

sizes that three variables – attitude, subjective norm, and perceived behavioral control – will directly predict behavioral intention, which in turn would predict behavior.

Each of these predictors was assumed to play a somewhat equal role in a person's decision to recycle with attitude and perceived behavioral control being the dominant predictors. However, the results of the current study suggest a different level of influence as far as the intention to recycle was concerned. While attitude was found to be a significant predictor of recycling intention, the data do not support a strong influence of subjective norm and perceived behavioral control. Perceived behavioral control appears to be the least significant predictor of both recycling intentions and actual recycling behavior. In addition, behavioral intention and actual behavior – which was theoretically assumed to have a strong relationship – had a weaker correlation than expected (r=.186).

Comparison of the Effects of the Determinants of Intention

Initially, it was assumed that each of the three main predictor variables would have an equally significant ability to predict recycling intentions. However, the results show that this is not so. Residents felt they were in complete control over whether they recycle or not. They also reported they were largely uninfluenced by any referent group as far as their recycling intentions were concerned. In other words, there was no indication that any specific person or group of people controlled their decision to participate in recycling or not. The addition of the perceived behavioral control variable to the original two variables of the Theory of Reasoned Action did not increase the predictive ability of the model. The path of the perceived behavioral control variable to behavioral intention was as non-significant as its path to behavior. It appears that residents of this particular

community perceived recycling to be a behavior that is entirely, or virtually entirely, within their control.

On the other hand their assurance to be in control over whether they recycle or not, did not make this behavior more likely to occur. For example, the fact that recycling is not perceived as being difficult to comprehend and execute did not necessarily make it an activity that a person will engage in. Reflecting on the results of the regression analysis, attitudes were by far the most significant predictor of whether a person plans to recycle or not.

The weak predictive ability of subjective norms seems surprising at first. Many previous studies (Goldenhar 1991; Park et al. 1988) found a significant relationship between subjective norms and behavioral intention to recycle. This study's findings indicated only a minor influence of people close to the decision maker on whether he or she will recycle or not.

A major difference between this study and the cited examples might be found in the sampling area and population that was chosen for this research. For instance, the study by Park et al (1998) was conducted at the University of Hawaii with 200 students of whom about 65% were of Asian decent. Given the proclivity of this composition for typical Asian collectivist behavior patterns, it should not be surprising that subjective norms, being social in nature, had a significant influence on intention to recycle. Collectivist cultures tend to see themselves and their actions in relation to others.

Goldenhar (1991) also found a significant influence of subjective norms that can potentially be traced back to either the age of the respondents (undergraduate students) or

the lack of maturity of the recycling program in her study area. The latter argument will be discussed later in more detail.

Other researchers have found similar results as this study. Taylor and Todd (1995) found a significant but negative influence of subjective norms. They attributed this finding to a possible "rebel" behavior against the influence attempts of others. Since this study took place in a midsize city with a well-established recycling program, they also speculated that the maturity of the program could have been the reason for the results.

Gamba (2000), whose study was conducted in an area in San Francisco, did not find any evidence that either attitude or subjective norms explained the variance in intention to recycle. He concluded that the high rate of recycling participation indicates that recycling is a widespread practice in this urban area. As a result, the behavior is internalized and does not need any outside 'encouragement' from certain referent sources. Most of these studies analyzed perceived behavioral control as well and came to similar conclusions about this factor.

In light of these studies and others that predicted similar results, the following explanations can be offered. First, in contrast to the Goldenhar (1991) and Park et al (1988) studies that inquired on the recycling behavior of primarily students, studies that analyze the recycling behavior of the citizens of a community are faced with different lifestyles and behavior patterns. While students are usually more distant from the community in which they study, local residents consider it their home. Consequently citizens are more interested and concerned with local issues and politics. To contribute to a communal activity is largely seen as benefiting the individual in the end. Given these facts, residents are on average better informed about a local recycling program and more inclined to par-

ticipate, assuming an equally positive predisposition by both the students and residents. As a result subjective norms and perceived behavioral control elements may play a lesser role in one's intention to engage in recycling.

Second, a direct connection between perceived control and behavior can only be expected if actual control and perceived control are approximately the same. It is plausible to assume that citizens have a misinterpretation of how easy and convenient it is to recycle on a continuous basis. As the introductory example suggested, the effort to recycle a product such as aluminum cans may be linked directly to the instant accessibility of a recycling receptacle. One might perceive the activity as second nature or an internalized habit. The reality is often that neither the behavior, nor the intention for it, happens.

Finally, both subjective norms and perceived behavioral control are variables that require reflective and honest answers about potential personal shortcomings. In the former case, one has to admit to be potentially driven only by compliance with the wishes of others. In the latter case, one admits to potential lack of volition over one's own behavior. Neither of the two are traits that a person may easily admit to.

While these two issues are often an important concern in relation to a new program or product that people are largely unaware of, the recycling program in the study community is well established. This fact limits the occurrence of the two above phenomena even further. For example, if a recycling program – such as the "Recycle Gainesville" program – is in place long enough and is widely accepted, one knows about it and has no control issues at this point. Any decision to participate probably has been made and internalized. This may have effectively inoculated the person from any further influences. This fact is corroborated in the current study by a high educational level. Highly educated

people tend generally to be less motivated to comply with others without being given enough reason to do so (Ajzen 1988; Oskamp et al. 1991). The establishment of the program might also contribute to a quasi-institutionalization of it. People might perceive participation in the program as a codified directive, leaving little room for normative and control feelings.

All of these possible scenarios support the very strong and dominant relationship between attitudes and behavioral intention. Residents pointed out that their own beliefs and attitudes about recycling were primary factors predicting their intentions to do so. The more positive a resident evaluated recycling, the more they saw the benefits of recycling for themselves and their immediate environment. And the chances are better that they may contemplate engaging in a recycling behavior.

Finally, a more radical thought seems appropriate to entertain. The current study is not the first one that has found only limited influences of the determinants of intention on behavior or behavioral intention to recycle. For example, Gamba (2000), Guagnano et al. (1995) or Sparks and Shepherd (1992) also obtained results in which only attitude had a significant influence on recycling intentions. It might be possible that the Theory of Planned Behavior is not the most appropriate theory to explain recycling behavior. One is reminded of an argument by scholars, such as Thogersen (1996), who argued that recycling should be treated as an instance of prosocial behavior, because of its benefits to society and the environment. They asserted that "attitudes regarding this type of behavior are not based on thorough calculation ... but they are a function of the person's ... beliefs in what is the right or wrong thing to do" (Thogersen 1996). Given the results of the current study, this seems to be the case in particular in communities, where recycling pro-

grams have been solidly established. Consequently, research might need to look for alternative explanatory theories.

Connection between Intention and Behavior

Both the Theory of Reasoned Action and the Theory of Planned Behavior concluded that behavioral intention predicts behavior directly. This assumption was supported in the results of this study. However, the relationship between the two variables was much weaker than anticipated.

An obvious argument for this result is that behavior was measured with another question in the instrument. It had to rely on people's own account of their actual recycling behavior. While it is not suggested that the results are entirely invalid, there are certainly some issues of reliability with this way of measuring actual behavior.

Based on the relationships between the variables in the Theory of Planned Behavior, public entities in charge of recycling, as well as environmental protection interest groups, can see how residents feel and think about recycling. The variables may also show how these opinions determine citizens' actual participation in citywide recycling programs. The weak relationships found in the current study between some of the variables in the model leave room for further exploration of these parameters. Following in the fashion of the laddering technique, it is of interest to find out, which underlying values create the beliefs that flow into attitudes, norms and perceived control. An analysis of the survey questions exploring the proposed relationships between values and model parameters was performed to determine which values orientations were related to recycling and the environmental influence on the model parameters. The analysis also sought to determine how the inclusion of those values would reinforce the significance of the

model parameters in predicting recycling intentions. These relationships will be discussed more specifically in the next section.

Impact of Personal Values on Recycling Intentions

Review of Different Recycling Belief Components

The majority of Gainesville residents who took part in this study reported relatively positive attitudes toward recycling and the benefits it has for the environment. They also reported to be largely capable of engaging in recycling. The mean responses indicate a strong positive feeling toward recycling and a somewhat less positive perception of capability to engage in it. Since it was hypothesized that different values orientations connect with specific predictor variables (e.g., rational values with attitude), it appears that the detected correlations offer explanations about the attitudinal and control elements. The attitudinal component appears to be subject to predominantly persuasive message needs. The control component appears to be subject to predominantly informative message needs.

The perception of control over one's behavior, or the lack thereof, appears to be driven by the knowledge of how recycling influences the environmental equilibrium and how a single individual can make a difference in that respect. This knowledge base is an acquired faculty. For example, it is the result of an individual actively valuing one's role in the community as far as this activity is concerned and the evaluation of one's self-concept in light of it. Therefore, egoistic values appear to drive the perceived control beliefs and hence the perceived behavioral control variable.

On the other hand, attitude toward recycling is the result of a person's individual assessment of the usefulness of the behavior. Self-centered thoughts are contrasted and

compared with other-centered thoughts in arriving at a satisfying conclusion. One recalls Ajzen and Fishbein's (1980) assumption that "humans are rational animals that systematically use or process the information available to them" and that "the information is used in a reasonable way to arrive at a behavioral decision." It seems that the contrast of egoistic and altruistic values is simply a mental process composed of two broad sets of ideas, what people believe and value (their ideology), and how they seek to achieve their valued goals (their preferred mode of reasoning or conduct) (Miller 1999). Those values sets were subsequently termed rational values. Rational choice deliberation is the weighing of options of what's best for the individual. Rational values seem to drive the behavioral beliefs and hence the attitude variable.

Finally, the tradition in which an individual is raised determines largely one's predisposition toward issues (normative belief patterns) as well as one's action in regards to it (motivation to comply). Being "social animals," humans strive for the most part to fit in with their immediate environment, or an environment they chose to be part of. The "birds of a feather flock together" analogy applies well to where people choose to live, who they like to commingle with, and whose actions they follow and support. Close referents are not only important to one's self-concept, but they also mirror a behavior pattern that the individual has personally internalized. Traditional values pattern seem to drive normative beliefs as well as motivations to comply with others' desires and, as a consequence, drive the subjective norm variable.

Overview of Hypotheses

Hypotheses four through six made predictions about how specific values orientation would influence specific predictor variable of behavioral intention and in doing so would strengthen the predictive ability of the model.

Although correlations were found according to the predictions, the inclusion of values did not improve the model's predictive power. The different regression analyses did not show any significant increase in explaining the variance of recycling intention for any of the attitude, subjective norms, or perceived behavioral control elements.

Given the already weak influence of subjective norms and perceived behavioral control on intention, it can be perceived ambitious in retrospect to expect a significant change with the inclusion of another construct, such as values, which in theory is even further removed from intention than the attitudinal, normative and control predictors.

It is interesting to note, however, that the addition of rational values did have some influence on the attitude variable. In general, it leads to the conclusion that personal values do not play a direct significant role in explaining a person's intention to recycle.

Improvement of Predictability Power of the Model

The results of this study are similar to macro-environmental studies that found the relationship between values and behavior would increase the likelihood to determine what messages or scenarios will motivate people to engage voluntarily in proenvironmental behaviors (Guagnano, Stern and Dietz 1995; Guttierez Karp 1996). While both of these studies found that the analysis of deep-seated values would help to understand how people engage in programs that promote noncoercive solutions to social problems, they admitted that the findings were not entirely conclusive. As Stern, Dietz and Kalof (1993)

demonstrated in finding egoistic motives in addition to altruistic motives as antecedents of environment-protecting behavior, environmentally friendly behavior appears to be determined both by selfish and philanthropic motives. Most of the studies that applied values-based research models did so with the response variable being "environmental predisposition," a rather broad definition of proenvironmental behavior. However, in both studies, values demonstrated an improvement in the interpretive ability of the attitude model.

This conclusion seems to be supported as well by the current study, despite the fact that some of the hypothesized relationships were not supported by the data. The current findings also suggest that values appear to be more intricately tied to a person's cognitive makeup to be detected as easily as predicted with a survey based on an attitudinal model.

While the findings seem disappointing, the significant correlations that individual values orientations display with attitude, subjective norm and perceived behavioral control, and the even stronger correlations they display with belief and evaluation determinants of these predictor variables, raise the question of how values come into play in one's decision to recycle.

Rather than assuming an interaction of values dimensions with the predictors, it might be of value to assume an interaction effect between values and the belief components, the evaluation components, or both. Since the correlation results seem to be more stable and more significant, it appears to be a logical next step.

It might also be useful to use a larger number of values items per dimension and a different technique to obtain them. While the alpha values largely support a reliable di-

mensional construct (e.g., egoistic values), the use of techniques such as qualitative interviews might be beneficial to arrive at more refined dimensions in reference to recycling. For example, the traditional values dimension seems to play less of a role for a community as mobile and as committed to recycling as the one used for this study. This activity would also address the criticism that values dimensions used for recycling research are too broad and unspecific to be of significant impact.

Since the goal of the study was to lay a foundation for communication efforts, values may well have proven to be a significant contributor. Assuming a typical consumer behavior model, the decision to act is based on an attitude toward the object, which in turn is based on beliefs about cognitive or emotive benefits as a result of the action. Those beliefs are driven by the perception of how well the object fulfills one's needs and wants, which are mind states reflecting one's self-perception and sets of values. Applying a typical AIDA (Attention-Interest-Desire-Action) model, it seems furthermore that values supply the foundation for the emotional (desire) and conative (action) aspects of the process. In other words, knowledge of a situation passes through this value-driven filter that subsequently determines the way the person will act.

With the difficulty that social marketers have reaching their publics with a social message, it is important to understand that environmentally oriented values do have an influence on beliefs about an environmental issue (recycling), as well as attitudes and norms toward recycling.

If it can be concluded that values have predictive power to explain the variation of beliefs, attitudes, and norms about a social issue, then it would advance research into the practical application of this relationship. If further research were to determine a credible

and focused message about the recycling issue – a message that would have applied the learning from values research – it would increase the persuasive impact of the message. Such a message could then be incorporated into further campaigns.

Also, one would have to consider that fact that intentions as measured in this study occurred in a vacuum. No imminent problem situation was connected with intentions to recycle or not. This might have generated responses that could have been different from a tangible message or event, connected to it. For example, a scenario in which recycling would have been linked to reduction in asthma of children in the neighborhood or other reductions of threats emanating from local landfill waste, could have lead to different intentions or attitudes than those found in the current study. There appears to be a difference in the influence of values between generic and episodic research approaches.

Relevance for Public Entities Creating Recycling PSA Campaigns

The primary goal of the current study was to strengthen the Theory of Planned Behavior as a model that can be applied to recycling behavior research. Understanding the origins of recycling beliefs was thought to bode well for any potential communication effort. Convincing a community's population to actively partake in local recycling programs requires developing enough sensitivity toward the creation of household waste among citizens. In turn, a heightened awareness and desire to make a difference may lead to other prevention activities, such as trash reduction and reuse.

This study started with two assertions. First, recycling, being a topic in the realm of the marketing of social issues is faced with two key problems. The "product" of social marketing is oftentimes amorphous, a mere idea of what ought to be, which, in turn, has effects on promotion. Related to this is the understanding of consumer response. For ex-

ample, this includes the answer to the question of what constitutes the forces motivating adoption or rejection behavior (Fine 1981). Second, recycling – and with it the protection and preservation of natural resources – has not been of great concern to the U.S. government or the U.S. population (Hershkowitz 1998). Only recently did waste management issues emerge as a chief concern for state and local governments in the U.S., particularly in states with rapid population growths. This has triggered the call for stronger policy measures. Since the U.S. – unlike many European countries – did not choose to codify recycling behavior such as create laws that force people to engage in recycling or be punished in one way or another, managers of local recycling programs must understand how to change the perception of nature in order to position and "manage" public opinion concerning the environment.

The need to create intrinsic motivations is in particular important in situations where financial and resource problems within the community lead to a reduction or suspension of a well-organized recycling program (as the recent example of New York City demonstrated). The case of New York City will not only have effects on the citizens of New York, but due to media coverage of this high profile case can have influences on other citizens' willingness to continue to participate in their local programs as well.

To reconsider, recycling related studies (Van Liere and Dunlap 1981) posited that progress toward solving environmental problems is likely to be more dependent upon pro-environmental behaviors than ecological consciousness. The general assumption of recycling research was that action is either triggered by selfish motives (gains, cost avoidance) or adherence to accepted social norms in the society. Applying these principles to community recycling, it follows that successful communication efforts must either

promise a benefit ("You recycle, and we'll reduce your waste collection bill"), or threaten with a social outcast standing ("Don't remain the only one in your neighborhood who doesn't recycle," "We all recycle, why don't you?"). Taking into consideration that recycling wasn't even a ubiquitous accepted social norm, these approaches did not work universally. Pure information campaigns that simply explain how to recycle have shown to be less successful in the long run. First, these public service announcements are more educationally oriented. They disseminate an idea to an often untargeted audience with the emphasis on primarily achieving a cognitive change (here: increase in knowledge) without focusing on a behavioral change. Second, as the data regarding perceived behavioral control of this study suggest, most people do not feel incapable of recycling.

It appears that in affluent industrial societies, environmental behaviors like recycling are typically classified within the domain of morality in people's minds. Since different individuals tend to hold different moral beliefs, recycling managers need to determine the underlying motives for those different beliefs. A laddering model (Homer and Kahle 1988) that bases action beliefs on more general beliefs and attitudes, which in turn are based on personal values and self-concepts, seems to apply for this topic.

Recycling household waste is only one area that falls under the "prosocial, proenvironmental, egoistic value set" umbrella. People who are undecided about recycling should be communicated to in a way that appeals to their sets of values and standards. Effective communication could contribute in motivating them toward the activity of recycling. Feeling accomplishment from this simple activity, people might be compelled to engage in other activities, knowing they will contribute to society and feel the support of their community government.

It is of significance for public service communicators of social issues, such as recycling, to know what to say and how to say it. Undoubtedly, the long-term benefit of households that recycle is without question the welfare of the entire community with welfare to self a distant second. Following the tenets set forth in the values-enhanced model of the Theory of Planned Behavior can help public communicators and their agents design more persuasive and ultimately successful message elements.

What marketing communication tools should be used to effectively reach the community with a pro-recycling message? Criticized as ineffective and of little value, mass-mediated advertising has taken a backseat in many municipalities to more direct and personal approaches. The City of Gainesville, for example, is heavily involved in cooperative activities with local middle and high schools as well as community events (Earth Day, art fairs, etc.). The reason behind the former lies in the idea of an early intervention in the cognitive development of a position toward the issue in order to create intrinsically motivated future recyclers. The latter activity has more of an informative quality to explain the how-to issues (perceived behavioral control element) as well as an affective quality to create a "We're-in-this-together" feel (normative element).

While it is certainly commendable that community recycling managers have begun to use the entire toolkit of an Integrated Marketing Communication strategy, the weakness of approaches similar to the ones cited lies in their restricted reach (e.g., not everybody attends a fair) and the encounter of potentially dissonant or inoculated opinions. A middle school child will most likely only become a lifelong recycler, if other referents (e.g., parents, friends) promote this idea or behavior as well. He or she also might not believe in any of the promoted activities in school, if such referents have inoculated

him or her already with reasons to defend the opposite position. Group dynamics in the classroom render on-campus activities a rather normative character. For example, children follow the presenter or the group for motives other than the conviction of the action's usefulness. As a result, recycling demonstrations and games have the potential to generate extrinsically motivated recycling behavior, while the goal was to create an intrinsic motivation. While this hypothesized scenario has an equal chance to occur as the originally hoped one, an understanding of underlying values of recycling attitudes and behaviors also would have the potential to help answer the question if direct marketing activities (such as the school training teams) have merit and if they can succeed moving extrinsic motivations into the intrinsic realm.

Mass media advertising's alleged ineffectiveness might be the victim of similar problems. For example, the non-occurrence of a presupposed change in attitude or behavior is often attributed to the communication channel, while the real reason might have been a misinterpretation of the original attitude. Proper measurement of values formation will not only suggest the most effective message elements, but also might reflect upon the most beneficial tool or medium to use. It might also contribute to the question if public communication alone can succeed to resolve the public concern.

Ultimately, this study reinforces the initiative that a close cooperation between public service managers and universities has great merit for the guidance and administration of a variety of environmental and social issues. The application of academic skills to the solution of a social issue that benefits the local (or larger) population appears to be a rewarding service function for the academic community.

Limitations of the Study

This study, like any other research, has limitations. The following issues are considered to be limitations of this study.

First, the chosen survey technique (telephone interview) could have introduced bias into the randomness of the sample. Because telephone interviewing in social surveys has increased in recent years, telemarketing has become prevalent. A fundamental methodological problem associated with telephone surveys is how to maximize the response rate and avoid bias due to nonresponse. A variety of efforts were undertaken to reduce this bias, including weekend calls as a supplement to weekday evening calls, performing multiple callbacks, and accommodating requests for interview appointments. The remaining refusal rate of 38% seems to fit within the existing range of refusal rates. Attention was paid to arrive at the acceptable sample size of 400 respondents, a number that theoretically (Kalton 1983) guarantees sufficient representation of the study population. As a result, the original population universe had to be extended to achieve the acceptable number of 400.

Another limitation regarding the sample relates to the accurate representativeness of the makeup of the population at large, foremost the proportion of recyclers in the community. In the sample, 91% of respondents declared to recycle and 9% stated that they do not currently recycle. However, the official recycling rate for the Gainesville area is 58%. While this is technically a sample of households rather than individuals, it is somewhat difficult to determine how most demographic criteria accurately reflect the population at large. However, recycling activity should still surface as an accurate measure regardless of the unit of analysis. Consequently, it is assumed that there should not

have been significant differences in attitudes, norms and values between recycling and non-recycling segments of the respondents. However, it needs to be mentioned that the sample used in this study was not entirely representative of the population to which the study attempts to generalize. To account for potential interview bias (i.e., respondents affirmed intentions to recycle while in fact they would not), behavioral intentions were checked against actual current recycling behavior (from Questions 4 and 5 in the instrument). As was speculated, it reduced the overly inflated recycling number to a level somewhat closer to the Gainesville average (73%).

A second limitation might have been the location of where the study was conducted. It was originally assumed that a community with a strong recycling rate among its population might yield insights into what stimulates a population actively engaged in recycling. Perhaps a community with a lower recycling rate might actually provide a better sample environment. If the goal of the study was to make predictions on what message might stimulate a person to recycle, then insights into why residents of a particular community have negative attitudes and behavior patterns toward recycling might be more appropriate. If it would be feasible to find a community whose recycling office is equally active to provide and promote recycling opportunities as is the case for Gainesville, it would eliminate lack of service as a variable for non-recycling and elucidate the disconnect of opportunity and motivation more clearly. It is not thought that people's attitudes and beliefs would be so tremendously different between active and passive communities to render the findings inaccurate.

Given that this limitation exists, public promoters of recycling should be encouraged to approach any lingering reasons for non-recycling before highlighting the (future)

benefits of recycling. Once a convenient recycling infrastructure (e.g., curbside collection) has been established, an information campaign to explain recycling would be appropriate to eliminate any perceived control behavior issues. This would effectively reduce the determining factors of actual behavior or behavioral intent to attitudinal and normative issues that need to be addressed in subsequent social marketing promotions.

Third, reflecting briefly on the above-mentioned low correlation between intention and behavior, the current study cannot effectively conclude that a strong relationship of any parameter to behavioral intention will automatically lead to actual recycling behavior. It was previously mentioned that there is theoretical evidence that positive intention leads to positive behavior. There is disagreement about what respondent variable one ought to choose in discussing implications for communication efforts (based on the argument that any communication effort can at most influence an intention to do something, but not the actual act of doing). The ultimate proof of having measured the complete model would be to actually measure recycling behavior. This could entail activities, such as counting the amount of recycled garbage in the city. While this has been done in previous research (Gamba 2000), these studies have also found that intention and behavior do correlate sufficiently well. One can assume, then that certain mitigating factors, such as ill-serviced neighborhoods or predominant use of non-recyclable products in the household, might have influenced the answers or the actual recycling behavior.

Another possible limitation concerns the measures used to determine perceived behavioral control. As was explained previously (Chapter 2), there is a variety of literature on this variable, interpreting it slightly differently. While there is little dispute what it aims to measure, there is discussion of what predictor variables should be applied to

measure perceived behavioral control. Ajzen (1985) has not given a specific set of predictors for this variable, similar to the attitudinal beliefs and outcome evaluation pair, measuring attitude. Some subsequent literature (Taylor and Todd 1995) has supported the inclusion of the predictors 'efficacy' (control beliefs) and 'outcome measures' (perceived facilitation). Since recycling is a behavior that depends to a large extent on one's perception of how easy or difficult it is to perform the behavior, it might be valuable to incorporate several efficacy questions in future research to explore the relationship with intention and behavior.

An issue, closely connected to the above, pertains to the actual character of questions asked for each variable in the model. The low, sometimes surprisingly low, significance levels of certain variables can potentially be explained with the choices made to construct the instrument. The recurring issue in survey methodology of validity (do respondents give accurate answers that reflect true measurements of the construct) versus reliability (are there sufficient probes to arrive at a conclusive answer repetitively) is at the heart of this issue. Another concern regarding this issue is the above-mentioned generic nature of the questions. An implied episodic version (a threat scenario connected to recycling) might have led to a different outcome.

Given the difficulties presented in measuring constructs defined as latent variables, and given the skepticism that even if accepted as measurable these constructs might not apply to all members of a population equally, it is important to focus attention on arriving at measurements with as much reliability as possible.

It is possible that respondents, who have no opinion or attitude on recycling, either because they have little knowledge of the issue or have not thought about it, may be-

have randomly when responding to a survey question. In that case they might feel pressure during the interview to offer an opinion in response to a values or belief question, when in fact they have none. Because respondents usually wish to project a positive image and self-image, their random choices from the offered alternatives will increase the amount of random variation in the variable. As a measure to prevent this problem, the interviewer offered the respondents continuously the option to choose a "refuse" or "don't know" answer.

Another common reliability problem concerns an ambiguity of respondents with regard to variable cues and response scale alternatives. As was asserted in the opening remarks, it was hoped that proper pre-testing and variable specification largely eliminated confusion and misunderstanding among respondents. However, the potential for defining and measuring rather amorphous and seemingly intuitive constructs such as a value, a belief, and an attitude does exist. These constructs might be associated with cues that are relatively inaccessible and come to mind only as the result of some cognitive effort. Since people might not apply much cognitive effort to summon a personal value or attitude, forcing them to choose a single point on a continuum may cause them to make such choices randomly, increasing the amount of random measurement error. It is therefore the researcher's responsibility to minimize this problem. This was achieved by accepting regions of variable dimensions that the respondent finds acceptable (e.g., no overemphasizing a distinct difference between a "strongly agree" and "somewhat agree" answer), and simplifying the answer categories, where applicable. For example, the original nine-point scale of Schwartz' values measurement was reduced to the more reliable seven-point scale that was used for all other constructs.

While there is no assurance that any measure achieves complete reliability of these constructs, the study attempted to achieve statistically acceptable reliability of the group of items, hypothesized to measure separate aspects of the same concept, by checking for their internal consistency via the Cronbach's alpha test.

Suggestions for Future Research

The results provide the basis for future research endeavors that will examine more closely an impact of communication campaigns on recycling. Suggestions for additional avenues of research will be discussed.

First, an experimental study could apply the findings of this study by introducing stimuli in promotional messages, incorporating cues that underscore a specific value related to recycling. It has been asserted that values can explain intention through a psychological mechanism called laddering (Homer and Kahle 1988). It would be a worthwhile approach to test if messages, aimed at personal values, have the hypothesized effects on recycling behavior or behavioral intent.

Second, beyond investigating the message content, an exploration of the message medium would be insightful. For example, utilizing different forms of media (print, newspaper, radio, internet, etc.) could address the issue of what media environment constitutes the most effective medium for information on recycling. It has been mentioned by various researchers (Andreasen 1995; Martinez & Scicchitano 1998) that a multi-media campaign would most likely have the greatest effect for public service messages. In addition, it could be found that different media forms necessitate different message executions. This idea could advance beyond mass media outlets to include other communication venues at the disposal of Integrated Marketing Communication practitioners.

Third, to find support for the generalizability of the values-attitude-behavior chain future studies should be conducted that apply values differences and influences on behavior to other social issue spheres. Other issues that could be examined in the future could include anti-smoking, breast cancer awareness, racial profiling, forest fire prevention, and so on. While it should be evident that the values dimension that will be used by those research projects will have to be specific to the topic, the relationship between the values and its subsequent attitudinal and behavior patterns should continue to exist.

A similar study could be conducted which uses different survey methodologies, such as mail-in or face-to-face methods, or different methodologies altogether, such as qualitative methods. While the first idea serves primarily to uncover the most appropriate and most reliable technique for asking recycling questions, the second suggestion aims at discovering new insights into the topic. Since survey techniques deliver prefabricated options to a question, they give very little room for a respondent to elaborate on an issue. The use of in-depth interviews or focus groups may discover underlying values or motivations as to why people do or do not recycle and what cities could do to better communicate with their residents.

Furthermore, recycling beliefs and behavior could be analyzed looking at the interaction between organizational and individual recycling. Since it has become practice in some organizations to encourage and engage their employees in recycling of office materials, it would be of interest to ascertain if (a) organizational recycling behavior has an influence on the personal recycling behavior of those employees, and (b) if there is a difference in personal recycling behaviors between employees of organizations engaged in recycling and organizations that are not active.

Somewhat related to this issue is the idea of personal effort. The current study assumes in general positive recycling behavior based on positive attitudes, beliefs and values. However, it was mentioned that communities in Florida (including the community chosen for this study) offer curbside recycling. Some studies (Thogersen 1996) suggested that there is a difference in recycling behavior between curbside service and the establishment of drop-off centers. In the latter situations a recycling citizen has to load the recyclable garbage into his or her car and drive to the location to dispose of it. It was concluded that this activity demands a much greater personal effort on the part of the citizen than setting out a bin at the curbside. It might be useful to compare a curbside recycling community with a drop-off recycling community, testing for the values dimensions and adding the variable of personal effort.

Finally, there has been some debate about the linear and continuous nature of data that are measured on a Likert scale or a semantic differential. Critics of the continuous nature of scaled data argue that the answer categories of a scale are fixed-width categories and scaled data should be analyzed using logistical statistics. To account for this schism in measurement, a dataset could be analyzed using both linear regression and multinomial logistical regression to see if there are any differences in findings.

Conclusion

Considering the social and political implications for a successful recycling program, it is important that communities convince their residents to engage in a more pro-environmental behavior pattern. Given the fact that this is one among many social and environmental activities that a person engages in voluntarily, without any repercussion if

one chooses not to participate, it is essential that recycling programs reach people at a level that they understand and that motivates them to comply.

Social marketing theory suggests that positioning the idea of an ideal in a way that potential consumers of the issue accept this description will result in a favorable action toward the ideal solution for the issue. Recycling managers need to promote recycling as an activity that fulfils both personal needs and wants and serves the greater good. The promoted activity needs to occur without inconveniencing the very person it aims to reach. And, managers need to weigh their options between costs and perks of the program. Ultimately, recycling promoters need to achieve a situation in which individuals are internally motivated to engage in pro-recycling behavior and attitude patterns.

Few studies to date have looked at the influence that values can play in the accepted belief-behavior models, usually used for determining the influence factors of pro-recycling behavior. The researcher hopes that the current study begins to fill that void. While the study did not find overall conclusive evidence for a universal influence of values, it can be considered a starting point for further research. As such, its results have both theoretic and practical implications. On a theoretic level, the study provides more evidence for the Theory of Reasoned Action being an effective model to predict behavioral intention. The inconclusive findings regarding perceived behavioral control suggest that (a) intentions to recycle and actual recycling of household waste can be seen as volitional behavior, and (b) the Theory of Reasoned Action appears concurrently to be the more conclusive model for recycling compared to the Theory of Planned Behavior. This, in effect, expands the applicability of the theory.

On a practical level, this study suggests a revised approach to target local residents with recycling message elements. With the personal values dimension playing a significant role in personal belief and attitude formation, it seems conclusive that messages should include specific "values-centric" content elements instead of mere informational and emotional components. Messages should also not be unidimensional, but should be crafted to address specific target populations' salient beliefs and values regarding recycling. This would include the creation and manipulation of multiple messages at a time.

Overall, this study offers a direction to approach recycling communication to reach citizens by suggesting the inclusion of values as the one factor that is most likely at the heart of an individual's self-concept. It contributes to the overall field of mass communication, and the discipline of advertising in particular, in that it provides new and supporting evidence that the relatively new area of social marketing can make use of in-depth consumer behavior studies. It furthermore reinforces the value of researching citizens' thoughts, beliefs, and behavior frames before engaging in any communications campaign that aims to change or strengthen a habit such as recycling.

APPENDIX
SURVEY QUESTIONNAIRE

Hello, my name is _____ and I am calling you from the Florida Survey Research Center at the University of Florida. In cooperation with researchers at the University, we are conducting a survey about citizen opinions of the environment and recycling. This is not a sales call and your answers are confidential. You may stop this interview at any time. The survey should take about I5 minutes to complete. May I please speak to the person in your household who is I8 or older and has the next birthday?

We'd like to begin by asking you about environmental issues in Florida.

1. What do you think is the most important environmental issue facing Florida today? [INT: Do not read, mark one]

   [Drilling for oil off the coastline, preserving the Everglades, Pollution, Clean Air, Clean Water, Urban sprawl, Landfills, Hazardous Waste, Protecting the aquifer, other _____]

2. I'll read you a list of environmental issues facing the state of Florida. Using a scale from 1 to 7, where one is not concerned at all and seven is extremely concerned, please tell me how concerned you are about each of the following:

   a. Drilling for oil off the Florida coastline
   b. Preserving the Florida Everglades
   c. Industrial or agricultural pollution
   d. Urban sprawl and development
   e. Recycling of hazardous waste materials
   f. Recycling of household wastes

Now, we'd like to ask you some questions about recycling.

3. Do you ever recycle household materials? [Probe if needed: like newspaper, glass, aluminum, plastic]
   [YNDR]

IF YES

4. I'll read you a list of commonly recycled items. For each item, please tell me whether you usually recycle these items, occasionally recycle these items, or never recycle these items:
   a. Newspapers [U, O, N, DK, R]

b. Other paper / cardboard [U, O, N, DK, R]
c. Glass jars & bottles [U, O, N, DK, R]
d. Aluminum cans [U, O, N, DK, R]
e. Plastic bottles [U, O, N, DK, R]
f. Steel cans [U, O,N, DK, R]

IF NO

5. Why don't you recycle? [INT: Do not read, mark all that apply]

[Don't know how, Don't want to, Not available where I live, Takes too much time, Too difficult, DK, R]

(ALL)

6. Do you recall seeing or hearing any public service announcements or advertisements about recycling recently? [YNDR]

IF YES

Were those announcements _____

a. On television [YNDR]
b. On the radio [YNDR]
c. In a newspaper or magazine [YNDR]
d. Other (describe) _____

Next, I will read you a list of statements. For each, please tell me how likely you think each statement is. Please use a scale from 1 to 7 where one is extremely unlikely and seven is extremely likely.

7. During the next 30 days, how likely is it that you will take part in a city-sponsored recycling program? [1-7, DK, R]

8. During the next 30 days, how likely is it that you will recycle for cash? [1-7, DK, R]

Now, we'd like to know more about your opinions of recycling.

9. What are your main thoughts about participating in recycling? On a scale from 1 to 7, how would you rate this activity?
[Read each statements, 1 is the one extreme, 7 is the other extreme]

a. Participation in recycling is (foolish/wise) [1-7, DK, R]
b. Participation in recycling is (unimportant/important) [1-7, DK, R]
c. Participation in recycling is (harmful/beneficial) [1-7, DK, R]
d. Whether or not I recycle is completely up to me (disagree/agree) [1-7, DK, R]

10. On a scale from 1 to 7, where one is strongly disagree and seven is strongly agree, please tell me how much you agree with the following statement. [1-7, DK, R]

    a. Participation in recycling will help protect the environment
    b. Recycling reduces landfill use and waste
    c. Recycling is just simply the right thing to do
    d. Participating in recycling sets a good example for others to do it too
    e. Participating in recycling lowers my garbage bill and provides me with extra money
    f. By conserving natural resources recycling helps solve a national problem
    g. Recycling is a kind of community program in which everybody works together
    h. It is difficult to determine how the program works, i.e. what can be recycled
    i. Recycling is too time-consuming
    j. I have no convenient access to bins or space to place any bins
    k. Recycling takes too much effort
    l. Participating in recycling does not fit with my lifestyle and daily routine

11. Now, I'll read you a general list of statements about the importance of community and recycling programs. Using a scale from 1 to 7 where one is extremely unimportant and seven is extremely important, how important would you say the following statement is to your decision whether or not to recycle?

    a. I want to protect the environment [1-7, DK, R]
    b. I like to decrease landfill use and messy trash [1-7, DK, R]
    c. I feel better about myself because it is the right thing to do. [1-7, DK, R]
    d. I get pleasure from setting a good example for others [1-7, DK, R]
    e. Lowering my garbage bill and earning extra money are worthwhile goals [1-7, DK, R]
    f. It is important for me to participate in programs that help solve national problems [1-7, DK, R]
    g. I enjoy participating in community programs [1-7, DK, R]
    h. I need to understand the program and its goals to consider engaging in it [1-7, DK, R]
    i. A community activity must not be too time-consuming [1-7, DK, R]
    j. A community program that I engage in should be convenient for me and take little effort [1-7, DK, R]
    k. I don't like to participate in activities if they make my life more difficult [1-7, DK, R]
    l. The program I engage in needs to fit with my lifestyle and my daily routine [1-7, DK, R]

Next, we'd like to know about people or groups that may influence your decisions about whether or not to recycle.

12. Using a scale from 1 to 7, where one is strongly disagree and seven is strongly agree; please tell me how much you agree with the statement that most people who are important to you think that you should recycle. [1-7, DK, R]

13. Using the same scale from 1 to 7, where one is strongly disagree and seven is strongly agree; please tell me how much you agree with the statement that _____ think that you should recycle. [1-7, DK, R]

    a. Your Family members
    b. Your Friends
    c. Your Neighbors
    d. Government Officials
    e. People in your household

14. With respect to recycling using a scale from 1 to 7, where one is extremely unlikely and seven is extremely likely; please tell me how likely it is that you would want to do what _____ thinks you should do? [1-7, DK, R]

    a. Your Family members
    b. Your Friends
    c. Your Neighbors
    d. Government Officials
    e. People in your household

Next, I just have a few general questions about the values and principles that are important in your life.

15. Again using a scale from 1 to 7 where one is extremely unimportant and seven is extremely important, please tell me how important each of the following principles is to your value system:

    a. Authority to lead others
    b. Having control over others
    c. Having material possessions and money
    d. Having an impact on other people and events
    e. Living in a world that is free of war and conflict
    f. Equal opportunity for all people
    g. Correcting social injustice
    h. Working for the welfare of others
    i. Feeling unity with nature
    j. Protecting the environment
    k. Respecting the Earth

l. Showing respect to your elders
m. Meeting your obligations and duties
n. Being clean and neat
o. Using courtesy and good manners
p. Living in a stable and orderly society

Finally, I just have a few demographic questions for statistical purposes.

16. Gender [don't ask – just record] [male, female]

17. In what year were you born? [year]

18. How many years have you lived in Alachua County? [INT: if less than one year, fill in 0][number, DK, R]

19. What is your current employment status? [Full-time, part-time, not employed, retired, student, DK, R]

    IF Full- or Part-time:
    19a. Which of the following categories best describes the field in which you work? [education/academics, health/medical, manufacturing, agriculture, retail, DK, R]

20. What is the highest level of education that you have completed? [8th grade or less, some high school, high school graduate, technical/vocational school, some college, college graduate, graduate/professional school, R]

21. Just for statistical purposes, can you tell me if your family's total yearly income before taxes is less than $35,000 or more than $35, 000? [less, more, DK, R]

    IF under $35,000:
    21a. And is that: [under $20,000, $20,000-$34,999, DK, R]

    IF over $35,000:
    21a. And is that: [$35,000-$49,999, $50,000-$69,999, $70,000 or more, DK, R]

22. Which of the following best represents your political orientation? [Conservative, Moderate, Liberal, DK, R]

23. And, are you registered to vote? [YNDR]
    IF YES:
    23a. Are you registered as ___?
    [Democrat, Republican, Independent, Libertarian, Other, DK, R]

    IF Democrat or Republican:

23b. Would you consider yourself to be a strong or not very strong [Democrat or Republican]? [S, NS, DK, R]

IF Independent:
23c. Would you consider yourself to be closer to the Republican or Democratic Party? [R, D, DK, R]

24. Just to make sure that we have a representative sample, would you tell me your race?
[White, Black/African American, Asian, American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Other, Two or more races (bi-, multiracial), DK, R]

24a. And would you say that you are of Hispanic ancestry or not? [YNDR]

25. Do you have a religious affiliation? [YNDR]

IF YES:
25a. What is your religious affiliation?
[Catholic, Protestant, Christian, Jewish, Muslim/Islamic, Buddhist, Hindu, Atheist, Agnostic, Other, DK, R]

IF Protestant or Christian:
25b. What denomination is that? [INT: Do not read, mark one response]
[Baptist, Southern Baptist, Lutheran, Methodist, Episcopalian, Presbyterian, Evangelical, Pentecostal, Fundamentalist, Unitarian, 7th Day Adventist, LDS/Mormon, Christian Scientist, Other, DK, R]

26. Could you please tell me your 5-digit zip code? [number, DK, R]

That concludes our survey. Thank you for your time and participation. Have a nice evening (day).

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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy

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